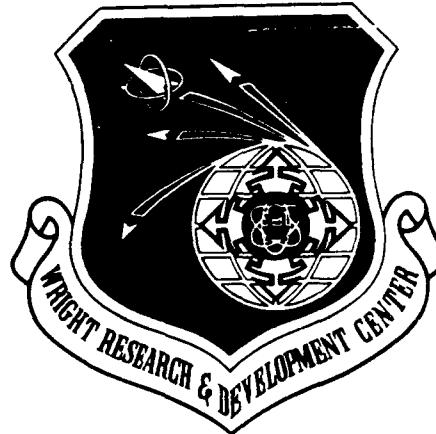


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WRDC-TR-90-8007
Volume V
Part 15



INTEGRATED INFORMATION SUPPORT SYSTEM (IISS)
Volume V - Common Data Model Subsystem
Part 15 - Neutral Data Manipulation Language (NDML) Precompiler
Decomposition Conceptual Schema NDML Request Product Specification

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Integration Technology Services
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Fairborn, OH 45324-6209

September 1990

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WRIGHT RESEARCH AND DEVELOPMENT CENTER
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WRIGHT-PATTERSON AIR FORCE BASE, OHIO 45433-6533

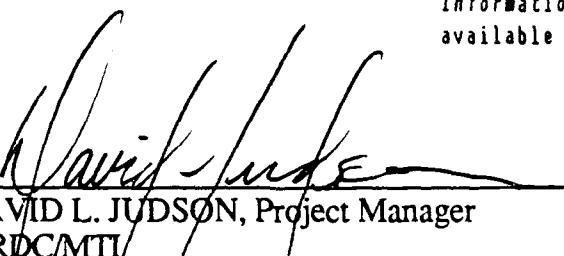
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25 July 91
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FOREWORD

This technical report covers work performed under Air Force Contract F33600-87-C-0464, DAPro Project. This contract is sponsored by the Manufacturing Technology Directorate, Air Force Systems Command, Wright-Patterson Air Force Base, Ohio. It was administered under the technical direction of Mr. Bruce A. Rasmussen, Branch Chief, Integration Technology Division, Manufacturing Technology Directorate, through Mr. David L. Judson, Project Manager. The Prime Contractor was Integration Technology Services, Software Programs Division, of the Control Data Corporation, Dayton, Ohio, under the direction of Mr. W. A. Osborne. The DAPro Project Manager for Control Data Corporation was Mr. Jimmy P. Maxwell.

The DAPro project was created to continue the development, test, and demonstration of the Integrated Information Support System (IISS). The IISS technology work comprises enhancements to IISS software and the establishment and operation of IISS test bed hardware and communications for developers and users.

The following list names the Control Data Corporation subcontractors and their contributing activities:

<u>SUBCONTRACTOR</u>	<u>ROLE</u>
Control Data Corporation	Responsible for the overall Common Data Model design development and implementation, IISS integration and test, and technology transfer of IISS.
D. Appleton Company	Responsible for providing software information services for the Common Data Model and IDEF1X integration methodology.
ONTEK	Responsible for defining and testing a representative integrated system base in Artificial Intelligence techniques to establish fitness for use.
Simpact Corporation	Responsible for Communication development.
Structural Dynamics Research Corporation	Responsible for User Interfaces, Virtual Terminal Interface, and Network Transaction Manager design, development, implementation, and support.
Arizona State University	Responsible for test bed operations and support.

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SECTION 1

SCOPE

1.1 Identification

This specification establishes the design of function pre5, "decompose cs ndml", one of the major functions of the configuration item "precompiler" to be built and formally accepted by the icam program office. This CI constitutes one of the subsystems of the common data model processor (cdmp).

1.2 Functional Summary

The purpose of this computer program configuration item (cpci) is to break down a cs ndml transaction, or request, into its various cs ndml subtransactions. The following functions will be performed by this cpci:

1. Map all cs attribute use classes, entity classes and relation classes;
2. Identify all unions, intra database joins, inter database joins and unions and not in set operators;
3. Reformat the original request into single database subtransactions;
4. Control further code generation of request processors.

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SECTION 2

DOCUMENTS

2.1 Reference Documents

1. ICAM Documentation Standards: IDS15012000A, 28 December, 1981.
2. D. Appleton Co., CDM Administrators Manual; UM620141000, March 1984.
3. D. Appleton Co., CDM1-IDEF Model of the Common Data Model: CCS620141000, 15 May 1985.
4. D. Appleton Co., Computer Program Development Specification (DS) for ICAM Integrated Support System (IISS) Configuration Item: NDML Precompiler; DS620141200, October 1984.
5. D. Appleton Co., Embedded NDML Programmer's Reference Manual: PRM620141200, March 1985.
6. Softech, Inc., NTM Programmer's Guide; UM620140001, July 1984.
7. Control Data Corp., Computer Program Development Specification (DS) for ICAM Integrated Support System (IISS) configuration item: NDDL Command Processor: DS620141100, June 1985.

2.2 Terms and Abbreviations

Attribute Use Class: (AUC)

Conceptual Schema: (CS)

Common Data Model Processor: (CDMP)

Common Data Model: (CDM) Describes common data application process formats, form definitions, etc, of the IISS and includes conceptual schema, external, internal schemas, and schema transformation operators.

Data Field: (DF) An element of data in the external schema. It is by this name that an NDML programmer references data.

Database Management System: (DBMS)

Distributed Request Supervisor: (DRS) This IISS CDM subsystem configuration item controls the execution of distributed NDML queries and non distributed updates.

Domain: A logical definition of legal attribute class values.

Domain Constraint: Predicate that applies to a single

domain.

External Schema: (ES)

Forms: Structured views which may be imposed on windows or other forms. A form is composed of fields where each field is a form, item, or window.

Forms Processor: (FP) A set of callable execution time routines available to an application program for form processing.

Internal Schema: (IS)

Integrated Information Support System: (IISS) A test computing environment used to investigate, demonstrate and test the concepts of information management and information integration in the context of Aerospace Manufacturing. The IISS addresses the problems of integration of data resident on heterogeneous databases supported by heterogeneous computers interconnected via a local Area Network.

Mapping: The correspondence of independent objects in two schemas: ES to CS or CS to IS.

Network Transaction Manager: (NTM) Performs the coordination, communication and housekeeping functions required to integrate the application processes and system services resident on the various hosts into a cohesive system.

Neutral Data Manipulation Language: (NDML) A language developed by the IISS project to provide uniform access to common data, regardless of database manager or distribution criteria. It provides distributed retrieved and single node updates.

ORACLE: Relational DBMS based on the SQL (Structured Query Language, a product of ORACLE Corp, Menlo Park, CA). The CDM is an ORACLE database.

Parcel: A sequential file containing sections source code of the input application program.

Request Processor: (RP) A COBOL program that will satisfy a retrieval or update NDML subtransaction against a particular Database Management System.

User Interface: (UI) Controls the user's terminal and interfaces with the rest of the system.

Virtual Terminal Interface: (VTI) Performs the interfacing between different terminals and the UI. This is done by defining a specific set of terminal features and protocols which must be supported by UI software which constitutes the Virtual Terminal Definition. Specific terminals are then mapped against the Virtual Terminal software by specific software modules written for each type of real terminal supported.

SECTION 3

REQUIREMENTS

3.1 Structural Description

A graphic portrayal of this CPCl is included in Section 3.10. This chart shows the hierarchical relationship of each module making up this CPCl.

All functionality of PRE5 is contained in many COBOL modules that are called by module CDPRE5. A separate module CDDBTP is used to look up certain information about a database.

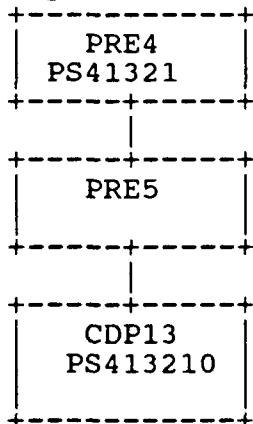
3.2 Functional Flow

This CPCl implements the logic defined in the Development Specification for this CPCl. Details of inputs/outputs and relationships between modules are to be found in Section 3.10.

This CPCl has been designated to operate in a batch or interactive mode. It must operate in the system environment established for IISS; that is, use of the Network Transaction Manager. It must use the ORACLE DBMS installed on a DEC VAX computer.

3.3 Interfaces

The following diagram depicts the interface of PRE5 with other CPCl's in the system.



3.3.1 Inputs/Outputs

The following table depicts the inputs and outputs of this CPCl. A detail description for each item can be found in the DS for this CPCl.

FUNCTION: PRE5

<u>INPUT</u>	<u>OUTPUT</u>
CS Action List	Module Status
CS Qualify List	
ES Action List	
ES Qualify List	
User View Abbreviation List	
Code Generator Table	
I/O Status indicator	
Parcel 1 File Name	
Parcel 2 File Name	
Parcel 3 File Name	
Parcel 4 File Name	
Host of the precompiler	
Host the AP is to run on	
Source Language	
Error File Name	
Boolean List	
Logical Unit of Work	
Results Field Table	
JQG Attribute Pair List	
Block Stack	
First Inner Select Indicator	
Fortran Variable Table	
Sub Processor Language	
Embedded Language	
Cursor Table	
Whenever Table	

3.4 Program Interrupts

Not applicable to this CPC1.

3.5 Timing and Sequencing Description

This module, CDPRE5, is called from CPC1 PRE4 for each conceptual schema NDML request. A conceptual schema request may be the user's original request or a referential integrity test which is handled as a search request. Control logic CDPRE5 in turn translates each request into many subtransactions. When complete, CDP13 is called by CDPRE5. CDP13 is the module which controls code generation for each subtransaction.

3.6 Special Control Features

Not applicable to this CPC1.

3.7 Storage Allocation

3.7.1 Database Definition

The database used by this CPC1 is the Common Data Model (CDM) database. This model is defined by the CDM1, the IDEF-1 model of the CDM, Reference Document Number 3.

3.7.1.1 File Description

No permanent files have been defined for this CPC1. It may use temporary scratch files for such things as generated program source code or temporary query results.

3.7.1.2 Table Description

All tables used by this CPC1 have been defined by the Development Specification for this CPC1.

3.7.1.3 Item Description

Not applicable to this CPC1.

3.8 Object Code Creation

The object code for this CPC1 will be created by the system integration test team by using defined IISS Software Configuration Management procedures. This CPC1 will use the COBOL language compiler.

3.9 Adaptation Data

This CPC1 has been coded using ANSI COBOL language. The intent was to provide a transportable system. Any system environment supporting this language, a virtual memory management scheme, the COMM and NTM subsystem of IISS and the ORACLE Database Management System should be able to support this CPC1. Every possible attempt has been made to localize and identify any machine or environment dependent modules through the original design of the IISS and application of Configuration Management Procedures.

3.10 Detail Design Description

The following sections have been computer generated for this CPCI.

3.10.1 Where Include File Used List

The following lists each include file in the documentation group and all the modules documented in this specification which include them. The purpose of each module is listed as well.

DOCGROUP PS41232 Where-include-file-used List

Include File	Module Name
-----	-----
ERRCDM	CDPRE5A CDPRE5B CDPRE6 P5ALGID P5AUCST P5CMA P5CMATS P5DF1 P5DFDT P5DT P5ECHP P5EDF P5EINFO P5HOST P5HP P5IAUC P5KCM P5MAPAL P5PRIM P5RCSM P5RDF P5RULES P5SETTB P5UNION P5UPD
SUBPROC	CDPRE5A P5UPD
ISAL	CDPRE5A

DOCGROUP PS41232 Where-include-file-used List

Include File	Module Name
-----	-----
	CDPRE5B
	CDPRE6
	P5UPD
ISQUAL	CDPRE5A
	CDPRE5B
	CDPRE6
	P5UPD
CSQUAL	CDPRE5A
	CDPRE5B
	CDPRE6
	P5UPD
BOOLST	CDPRE5A
SUBBOOL	CDPRE5A
	CDPRE6
ERRPRO	CDPRE5A
	CDPRE5B
	CDPRE6
	P5ALGID
	P5AUCST
	P5CMA
	P5CMATS
	P5DF1
	P5DFDT
	P5DT
	P5ECHP
	P5EDF

DOCGROUP PS41232 Where-include-file-used List

Include File	Module Name
-----	-----
	P5EINFO
	P5HOST
	P5HP
	P5IAUC
	P5KCM
	P5MAPAL
	P5PRIM
	P5RCSM
	P5RDF
	P5RULES
	P5SETTB
	P5UNION
	P5UPD
CHKCDM	CDPRE5B
	CDPRE6
	P5ECHP
	P5EINFO
	P5IAUC
	P5RULES
	P5UPD
ESAL	CDPRE5B
ESQUAL	CDPRE5B
CSAL	CDPRE5B
	CDPRE6
	P5UPD
RFTABLE	CDPRE5B

DOCGROUP PS41232 Where-include-file-used List

Include File -----	Module Name -----
APGRP	CDPRE6
ERRFS	CDPRE6 P5AUCST P5CMA P5ECHP P5EDF P5EINFO P5HOST P5HP P5KCM P5MAPAL P5PRIM P5RDF P5RULES P5SETTB P5UNION P5UPD
EOD	CDPRE6 P5ALGID P5AUCST P5CMA P5DF1 P5DFDT P5DT P5ECHP P5EDF P5HOST P5HP

DOCGROUP PS41232 Where-include-file-used List

Include File	Module Name
-----	-----
	P5IAUC
	P5KCM
	P5MAPAL
	P5PRIM
	P5RCSTM
	P5RDF
	P5RULES
	P5UNION
CMAT	
	CDPRE6
	P5CMA
	P5UPD
SETTAB	
	CDPRE6
	P5AUCST
	P5RCSTM
	P5SETTB
	P5UPD
APAT	CDPRE6
APINFO	CDPRE6
APRK	CDPRE6
OCCTAB	CDPRE6
P5TMPST	CDPRE6
	P5AUCST
	P5RCSTM
	P5SETTB
P5EDFT	

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DOCGROUP PS41232 Where-include-file-used List

Include File	Module Name
-----	-----
	P5CMA
	P5EDF
P5ECINF	P5EINFO
P5ROJ	P5EINFO
REDDAT	P5HOST
	P5HP
	P5MAPAL
	P5PRIM
P5AUCIS	P5HOST
	P5HP
	P5MAPAL
	P5PRIM
REPLJN	P5KCM
P5TMPKY	P5KCM
P5KEYJN	P5KCM
P5TOT	P5RDF
P5UEC	P5UNION

3.10.2 Where External Routine Used List

The following lists each external function or routine in the documentation group and all the documented modules which call it. The purpose of each module is listed as well.

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30 September 1990

DOCGROUP PS41232 Where-external-routine-used List

System Module	Module Name
-----	-----
ERRPRO	CDPRE5A CDPRE5B CDPRE6 P5ALGID P5AUCST P5CMA P5CMATS P5DF1 P5DFDT P5DT P5ECHP P5EDF P5EINFO P5HOST P5HP P5IAUC P5KCM P5MAPAL P5PRIM P5RCSTM P5RDF P5RULES P5SETTB P5UNION P5UPD
CDPR7KY	CDPRE6
RPTERR	CDPRE6 P5AUCST

DOCGROUP PS41232 Where-external-routine-used List

System Module	Module Name
-----	-----
	P5CMA
	P5ECHP
	P5EDF
	P5HOST
	P5HP
	P5KCM
	P5MAPAL
	P5PRIM
	P5RCSM
	P5RDF
	P5RULES
	P5SETTB
	P5UNION
	P5UPD
SQLSCA	CDPRE6
	P5ALGID
	P5AUCST
	P5CMA
	P5CMATS
	P5DF1
	P5DFDT
	P5DT
	P5ECHP
	P5EDF
	P5HOST
	P5HP
	P5IAUC
	P5KCM
	P5MAPAL
	P5PRIM

DOCGROUP PS41232 Where-external-routine-used List

System Module	Module Name
-----	-----
	P5RCSTM
	P5RDF
	P5RULES
	P5UNION
SQLBS1	CDPRE6
	P5ALGID
	P5AUCST
	P5CMA
	P5CMATS
	P5DF1
	P5DFDT
	P5DT
	P5ECHP
	P5EDF
	P5HOST
	P5HP
	P5IAUC
	P5KCM
	P5MAPAL
	P5PRIM
	P5RCSTM
	P5RDF
	P5RULES
	P5UNION
SQLSCH	CDPRE6
	P5ALGID
	P5AUCST
	P5CMA
	P5CMATS

DOCGROUP PS41232 Where-external-routine-used List

System Module	Module Name
-----	-----
	P5DF1
	P5DFDT
	P5DT
	P5ECHP
	P5EDF
	P5HOST
	P5HP
	P5IAUC
	P5KCM
	P5MAPAL
	P5PRIM
	P5RCSM
	P5RDF
	P5RULES
	P5UNION
SQLSCC	CDPRE6
	P5ALGID
	P5AUCST
	P5CMA
	P5CMATS
	P5DF1
	P5DFDT
	P5DT
	P5ECHP
	P5EDF
	P5HOST
	P5HP
	P5IAUC
	P5KCM
	P5MAPAL

DOCGROUP PS41232 Where-external-routine-used List

System Module	Module Name
-----	-----
	P5PRIM
	P5RCSM
	P5RDF
	P5RULES
	P5UNION
SQLTOC	CDPRE6
	P5ALGID
	P5AUCST
	P5CMA
	P5ECHP
	P5EDF
	P5HOST
	P5HP
	P5KCM
	P5MAPAL
	P5PRIM
	P5RCSM
	P5UNION
SQLOSQ	CDPRE6
	P5ALGID
	P5AUCST
	P5CMA
	P5CMATS
	P5DF1
	P5DFDT
	P5DT
	P5ECHP
	P5EDF
	P5HOST

DOCGROUP PS41232 Where-external-routine-used List

System Module	Module Name
-----	-----
	P5HP
	P5IAUC
	P5KCM
	P5MAPAL
	P5PRIM
	P5RCSTM
	P5RDF
	P5RULES
	P5UNION
SQLADR	CDPRE6
	P5ALGID
	P5AUCST
	P5CMA
	P5CMATS
	P5DF1
	P5DFDT
	P5DT
	P5ECHP
	P5EDF
	P5HOST
	P5HP
	P5IAUC
	P5KCM
	P5MAPAL
	P5PRIM
	P5RCSTM
	P5RDF
	P5RULES
	P5UNION
SQLAB1	

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30 September 1990

DOCGROUP PS41232 Where-external-routine-used List

System Module	Module Name
-----	-----
	CDPRE6
	P5ALGID
	P5AUCST
	P5CMA
	P5CMATS
	P5DF1
	P5DFDT
	P5DT
	P5ECHP
	P5EDF
	P5HOST
	P5HP
	P5IAUC
	P5KCM
	P5MAPAL
	P5PRIM
	P5RCSTM
	P5RDF
	P5RULES
	P5UNION
SQLLEXE	CDPRE6
	P5ALGID
	P5AUCST
	P5CMA
	P5CMATS
	P5DF1
	P5DFDT
	P5DT
	P5ECHP
	P5EDF

DOCGROUP PS41232 Where-external-routine-used List

System Module	Module Name
-----	-----
	P5HOST
	P5HP
	P5IAUC
	P5KCM
	P5MAPAL
	P5PRIM
	P5RCSTM
	P5RDF
	P5RULES
	P5UNION
SQLAD1	CDPRE6
	P5ALGID
	P5AUCST
	P5CMA
	P5CMATS
	P5DF1
	P5DFDT
	P5DT
	P5ECHP
	P5EDF
	P5HOST
	P5HP
	P5IAUC
	P5KCM
	P5MAPAL
	P5PRIM
	P5RCSTM
	P5RDF
	P5RULES
	P5UNION

DOCGROUP PS41232 Where-external-routine-used List

System Module	Module Name
-----	-----
SQLFCH	CDPRE6 P5ALGID P5AUCST P5CMA P5CMATS P5DF1 P5DFDT P5DT P5ECHP P5EDF P5HOST P5HP P5IAUC P5KCM P5MAPAL P5PRIM P5RCSM P5RDF P5RULES P5UNION
SQLCLS	CDPRE6 P5ALGID P5AUCST P5CMA P5ECHP P5EDF P5HOST P5HP P5KCM

DOCGROUP PS41232 Where-external-routine-used List

System Module	Module Name
-----	-----
	P5MAPAL
	P5PRIM
	P5RCSM
	P5UNION
SQLTFL	P5CMA
	P5CMATS
	P5DF1
	P5DFDT
	P5DT
	P5EDF
	P5IAUC
	P5RDF
	P5RULES
SQLOPN	P5CMA
	P5CMATS
	P5DF1
	P5DFDT
	P5DT
	P5EDF
	P5IAUC
	P5RDF
	P5RULES
ROJCHK	P5EINFO
CDGTN	P5UPD

3.10.3 Main Program Parts List

The following lists each Main Program in the documentation group and all the modules which are called either by that module itself or by any of the documented modules which it calls. It is possible for a non-main module to be listed more than once if it is called by multiple modules. The called modules, in this case known as program parts, are marked as to whether they are documented here. If so, the phrase "well-defined module" appears by the module name, if not it is an "external "routine". The Purpose of the Main Program module is listed as well.

DOCGROUP PS41232 Main Program Parts List

Main Pgm Name	Module Name	Module Type
-----	-----	-----
CDPRE5A	ERRPRO	External routine
CDPRE5B	ERRPRO	External routine
CDPRE6	ERRPRO	External routine
	CDPR7KY	External routine
	RPTERR	External routine
	SQLSCA	External routine
	SQLBS1	External routine
	SQLSCH	External routine
	SQLSCC	External routine
	SQLTOC	External routine
	SQLSQS	External routine
	SQLADR	External routine
	SQLAB1	External routine
	SQLEXE	External routine
	SQLAD1	External routine
	SQLFCH	External routine
	SQLCLS	External routine
P5ALGID	ERRPRO	External routine
	SQLSCA	External routine
	SQLBS1	External routine
	SQLSCH	External routine
	SQLSCC	External routine
	SQLTOC	External routine
	SQLSQS	External routine
	SQLADR	External routine
	SQLAB1	External routine
	SQLEXE	External routine

DOCGROUP PS41232 Main Program Parts List

Main Pgm Name	Module Name	Module Type
-----	-----	-----
P5AUCST	SQLAD1	External routine
	SQLFCH	External routine
	SQLCLS	External routine
	ERRPRO	External routine
	RPTERR	External routine
	SQLSCA	External routine
	SQLBS1	External routine
	SQLSCH	External routine
	SQLSCC	External routine
	SQLTOC	External routine
	SQLOSQ	External routine
	SQLADR	External routine
	SQLAB1	External routine
	SQLEXE	External routine
	SQLAD1	External routine
SQLFCH	External routine	
SQLCLS	External routine	
P5SETTB	Well-defined module	
P5CMA	ERRPRO	External routine
	RPTERR	External routine
	SQLSCA	External routine
	SQLBS1	External routine
	SQLSCH	External routine
	SQLSCC	External routine
	SQLTOC	External routine
	SQLOSQ	External routine
	SQLADR	External routine
	SQLAB1	External routine
SQLEXE	External routine	

DOCGROUP PS41232 Main Program Parts List

Main Pgm Name	Module Name	Module Type
-----	-----	-----
P5CMATS	SQLAD1	External routine
	SQLFCH	External routine
	SQLCLS	External routine
	P5EDF	Well-defined module
	P5CMATS	Well-defined module
	SQLTFL	External routine
	SQLOPN	External routine
	P5DT	Well-defined module
	P5DFDT	Well-defined module
	ERRPRO	External routine
SQLSCA	External routine	
SQLBS1	External routine	
SQLSCH	External routine	
SQLSCC	External routine	
SQLOSQ	External routine	
SQLADR	External routine	
SQLAB1	External routine	
SQLEXE	External routine	
SQLAD1	External routine	
SQLFCH	External routine	
SQLTFL	External routine	
SQLOPN	External routine	
P5DF1	ERRPRO	External routine
	SQLSCA	External routine
	SQLBS1	External routine
	SQLSCH	External routine
	SQLSCC	External routine
	SQLOSQ	External routine
	SQLADR	External routine

DOCGROUP PS41232 Main Program Parts List

Main Pgm Name	Module Name	Module Type
-----	-----	-----
P5DFDT	SQLAB1	External routine
	SQLEXE	External routine
	SQLAD1	External routine
	SQLFCH	External routine
	SQLTFL	External routine
	SQLOPN	External routine
	ERRPRO	External routine
	SQLSCA	External routine
	SQLBS1	External routine
	SQLSCH	External routine
	SQLSCC	External routine
	SQLOSQ	External routine
	SQLADR	External routine
	SQLAB1	External routine
SQLEXE	External routine	
SQLAD1	External routine	
SQLFCH	External routine	
SQLTFL	External routine	
SQLOPN	External routine	
P5DT	P5DT	Well-defined module
P5DT	ERRPRO	External routine
	SQLSCA	External routine
	SQLBS1	External routine
	SQLSCH	External routine
	SQLSCC	External routine
	SQLOSQ	External routine
	SQLADR	External routine
	SQLAB1	External routine
SQLEXE	External routine	

DOCGROUP PS41232 Main Program Parts List

Main Pgm Name -----	Module Name -----	Module Type -----
P5ECHP	SQLAD1	External routine
	SQLFCH	External routine
	SQLTFL	External routine
	SQLOPN	External routine
P5EDF	ERRPRO	External routine
	RPTERR	External routine
	SQLSCA	External routine
	SQLBS1	External routine
	SQLSCH	External routine
	SQLSCC	External routine
	SQLTOC	External routine
	SQLOSQ	External routine
	SQLADR	External routine
	SQLAB1	External routine
	SQLEXE	External routine
	SQLAD1	External routine
	SQLFCH	External routine
	SQLCLS	External routine
	ERRPRO	External routine
RPTERR	External routine	
SQLSCA	External routine	
SQLBS1	External routine	
SQLSCH	External routine	
SQLSCC	External routine	
SQLTOC	External routine	
SQLOSQ	External routine	
SQLADR	External routine	
SQLAB1	External routine	
SQLEXE	External routine	

DOCGROUP PS41232 Main Program Parts List

Main Pgm Name	Module Name	Module Type
-----	-----	-----
P5EINFO	SQLAD1	External routine
	SQLFCH	External routine
	SQLCLS	External routine
	SQLTFL	External routine
	SQLOPN	External routine
P5HOST	ERRPRO	External routine
	ROJCHK	External routine
	P5ECHP	External routine
	P5RULES	Well-defined module
P5HP	ERRPRO	External routine
	RPTERR	External routine
	SQLSCA	External routine
	SQLBS1	External routine
	SQLSCH	External routine
	SQLSCC	External routine
	SQLTOC	External routine
	SQLOSQ	External routine
	SQLADR	External routine
	SQLAB1	External routine
	SQLEXE	External routine
	SQLAD1	External routine
	SQLFCH	External routine
	SQLCLS	External routine

DOCGROUP PS41232 Main Program Parts List

Main Pgm Name	Module Name	Module Type	
-----	-----	-----	
P5IAUC	SQLSCC	External routine	
	SQLTOC	External routine	
	SQLOSQ	External routine	
	SQLADR	External routine	
	SQLAB1	External routine	
	SQLEXE	External routine	
	SQLAD1	External routine	
	SQLFCH	External routine	
	SQLCLS	External routine	
P5KCM	ERRPRO	External routine	
	SQLSCA	External routine	
	SQLBS1	External routine	
	SQLSCH	External routine	
	SQLSCC	External routine	
	SQLOSQ	External routine	
	SQLADR	External routine	
	SQLAB1	External routine	
	SQLEXE	External routine	
	SQLAD1	External routine	
	SQLFCH	External routine	
	SQLTFL	External routine	
	SQLOPN	External routine	
	P5KCM	ERRPRO	External routine
RPTERR		External routine	
SQLSCA		External routine	
SQLBS1		External routine	
SQLSCH		External routine	
SQLSCC		External routine	
SQLTOC	External routine		

DOCGROUP PS41232 Main Program Parts List

Main Pgm Name	Module Name	Module Type
-----	-----	-----
P5MAPAL	SQLOSQ	External routine
	SQLADR	External routine
	SQLAB1	External routine
	SQLEXE	External routine
	SQLAD1	External routine
	SQLFCH	External routine
	SQLCLS	External routine
	ERRPRO	External routine
P5PRIM	RPTERR	External routine
	SQLSCA	External routine
	SQLBS1	External routine
	SQLSCH	External routine
	SQLSCC	External routine
	SQLTOC	External routine
	SQLOSQ	External routine
	SQLADR	External routine
	SQLAB1	External routine
	SQLEXE	External routine
	SQLAD1	External routine
	SQLFCH	External routine
SQLCLS	External routine	
ERRPRO	External routine	
RPTERR	External routine	
SQLSCA	External routine	
SQLBS1	External routine	
SQLSCH	External routine	
SQLSCC	External routine	
SQLTOC	External routine	
SQLOSQ	External routine	

DOCGROUP PS41232 Main Program Parts List

Main Pgm Name	Module Name	Module Type
-----	-----	-----
P5RCSM	SQLADR	External routine
	SQLAB1	External routine
	SQLEXE	External routine
	SQLAD1	External routine
	SQLFCH	External routine
	SQLCLS	External routine
	ERRPRO	External routine
	RPTERR	External routine
	SQLSCA	External routine
	SQLBS1	External routine
	SQLSCH	External routine
	SQLSCC	External routine
	SQLTOC	External routine
	SQLOSQ	External routine
	SQLADR	External routine
SQLAB1	External routine	
SQLEXE	External routine	
SQLAD1	External routine	
SQLFCH	External routine	
SQLCLS	External routine	
P5SETTB	Well-defined module	
P5RDF	ERRPRO	External routine
	RPTERR	External routine
	SQLSCA	External routine
	SQLBS1	External routine
	SQLSCH	External routine
	SQLSCC	External routine
	SQLOSQ	External routine
	SQLADR	External routine

DOCGROUP PS41232 Main Program Parts List

Main Pgm Name	Module Name	Module Type
-----	-----	-----
P5RULES	SQLAB1	External routine
	SQLEXE	External routine
	SQLAD1	External routine
	SQLFCH	External routine
	SQLTFL	External routine
	SQLOPN	External routine
P5SETTB	ERRPRO	External routine
	RPTERR	External routine
	SQLSCA	External routine
	SQLBS1	External routine
	SQLSCH	External routine
	SQLSCC	External routine
	SQLOSQ	External routine
	SQLADR	External routine
	SQLAB1	External routine
	SQLEXE	External routine
	SQLAD1	External routine
	SQLFCH	External routine
	SQLTFL	External routine
	SQLOPN	External routine
	P5UNION	ERRPRO
RPTERR		External routine
SQLSCA		External routine
SQLBS1		External routine
SQLSCH		External routine
SQLSCC		External routine

DOCGROUP PS41232 Main Program Parts List

Main Pgm Name	Module Name	Module Type
-----	-----	-----
	SQLTOC	External routine
	SQLSQS	External routine
	SQLADR	External routine
	SQLAB1	External routine
	SQLEXE	External routine
	SQLAD1	External routine
	SQLFCH	External routine
	SQLCLS	External routine
	P5DT	External routine
P5UPD	ERRPRO	External routine
	RPTERR	External routine
	CDGTN	External routine

3.10.4 Module Documentation

The following documentation describes information which is specific to each individual module in the documentation group being documented in this specification. It provides a compact way of getting information that would be otherwise buried within each module's source code.

The specific items in this module documentation have the following meanings:

NAME:	Name of program Module.
PURPOSE:	Purpose of Module as detailed in the source code.
LANGUAGE:	Programming language source code is written in. The choices are: VAX-11 FORTRAN C (I/S-1 Workbench 'C') VAX-11 COBOL
MODULE TYPE:	Whether a Program, Subroutine, or Function.
SOURCE FILE:	Name of Source File from file specification.
SOURCE FILE TYPE:	Source File Extension from file specification.
HOST:	Whether this is a host-dependent routine (VAX or IBM) or blank if host-independent.
SUBSYSTEM:	IISS sub-system this file resides in.
SUBDIRECTORY:	Sub-directory of that subsystem in which this file resides.
DOCUMENTATION GROUP:	Name of documentation group of which this source file is a member.
DESCRIPTION:	A description of the module as obtained from the source code.
ARGUMENTS:	The arguments with which this routine is called if it is a Subroutine or a Function.
INCLUDE FILES:	A list of all the files that are included into this module as well as their purposes.
ROUTINES CALLED:	Subroutines or Functions, either documented or external, called by this module, if any.

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CALLED DIRECTLY BY: The documented routines which call this module, if any.

USED IN MAIN PROGRAM(S): The documented Main Programs which contain this module in their parts list according to the list in section 3.10.3.

The Module Documentation is arranged alphabetically according to Module Name.

DOCGROUP PS41232 Module Documentation

NAME: CDPRE5A

PURPOSE: EVALUATE DISTRIBUTED AND/OR QUALIFICATION LOGIC

LANGUAGE: VAX-11 COBOL

SOURCE FILE: CDPRE5A

SOURCE FILE TYPE: COB

HOST:

SUBSYSTEM: CDM

SUBDIRECTORY: NDML

DESCRIPTION:

In order to determine whether an NDML WHERE clause is evaluatable at the internal schema level, PRE5A performs the following functions:

1. Determine whether any Type 2 or Type 3 conditions in the IS-QUALIFY-LIST participate in complex mapping algorithms or in a LIKE condition.
2. Groups Type 2 ES conditions into database sets for evaluation.
3. Evaluates the Type 2 ES conditions in a NDML clause from right to left, proceeding from innermost parentheses to outermost.
4. Builds a SUBTRANS-BOOLEAN-LIST for each subtransaction which contains all parenthesized logic and all the conditions from the IS-QUALIFY-LIST which are evaluatable at the internal schema level for that subtransaction.
5. Assigns an evaluation flag to all Type 2 and Type 3 conditions in the IS-QUALIFY-LIST identifying whether or not condition is evaluatable at the internal schema level. If the condition is evaluatable, the flag also identifies whether multiple search values were specified for the condition, whether the condition is ORed with conditions from the same record type, or whether the condition is ORed with other conditions from different record types.

The rules for determining which Type 2 ES conditions can be evaluated at the internal schema level are as follows. The rules

are exclusionary and must be applied in the order specified.

1. ORed conditions which are neither preceded nor followed by an

operator can be evaluated if the conditions have the same dbsetid. However, if any of the conditions participate in a complex mapping algorithm, have a LIKE operator, or have an "is null" (NL) or "is not null" (NN) operator associated with an outer-join operation, then none of the conditions can be evaluated.

2. ORed conditions which are neither preceded nor followed by an

operator cannot be evaluated if the conditions have different dbsetids.

3. ANDed conditions are eligible for evaluation. However, if a

condition participates in a complex mapping algorithm, has a LIKE operator, or has an "is null" (NL) or "is not null" (NN) operator associated with an outer-join operation, then that condition becomes ineligible for evaluation.

a. If the ANDed conditions are neither preceded nor followed by an operator, the conditions can be evaluated.

b. An expression containing all ANDed conditions, which is preceded by the operator AND, can be evaluated regardless of the dbsetids.

c. An expression containing all ANDed conditions having different dbsetids, which is preceded by the operator 'OR', may be eligible for evaluation. Rule 6 must be applied to determine final eligibility.

4. ORed conditions in an expression having the same dbsetid and

preceded by an operator may be eligible for evaluation.

Rules 6 and 7 must be applied to determine final eligibility of the expression. However, if a condition participates in a complex mapping algorithm, has a LIKE operator, or has an "is null" (NL) or "is not null" (NN) operator associated with an outer-join operation, then that condition becomes ineligible for evaluation.

5. No conditions in an expression containing ORed conditions having different dbsetids are eligible for evaluation regardless of the precedent operator.

6. ANDed conditions, or ORed conditions having the same dbsetid,

in an expression which is not preceded by an operator, but is

followed by the operator 'OR' may be eligible for evaluation.

- a. If the expression following the OR was not eligible for evaluation, then none of the conditions in the current expression are evaluatable.
- b. Any conditions in the current expression and the expression following the 'OR', which have the same dbsetid, are eligible for evaluation.
- c. Any condition in the expression following the 'OR' which does not have the same dbsetid as the conditions in the expression preceding the 'OR', become ineligible for evaluation, and vice versa.

7. ANDed conditions, or ORed conditions having the same dbsetid in an expression which is not preceded by an operator, but which is followed by the operator 'AND', are eligible for evaluation.

ARGUMENTS:

SUBTRANS-PROCESS-ID-TABLE	RECRD
IS-ACTION-LIST	RECRD
IS-QUALIFY-LIST	RECRD
CS-QUALIFY-LIST	RECRD
BOOLEAN-LIST	RECRD
SUBTRANS-BOOLEAN-LIST	RECRD
RET-STATUS	DSPLY[X(5)]

INCLUDE FILES:

ERRCDM
SUBPROC
ISAL
ISQUAL
CSQUAL
BOOLST
SUBBOOL
ERRPRO

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ROUTINES CALLED:

ERRPRO

DOCGROUP PS41232 Module Documentation

NAME: CDPRE5B
PURPOSE: DELETE QUALIFIED ENTRIES FROM CDMP TABLES.
LANGUAGE: VAX-11 COBOL
SOURCE FILE: CDPRE5B
SOURCE FILE TYPE: COB
HOST:
SUBSYSTEM: CDM
SUBDIRECTORY: NDML

DESCRIPTION:

- THIS FUNCTION WILL EXAMINE THE INTERNAL SCHEMA
QUALIFY LIST EVALUATION FLAG FOR EACH TYPE 2 AND 3 CONDITION
AND
DETERMINE IF ENTRIES CAN BE DELETED FROM IDENTIFIED CDMP
TABLES. THESE ENTRIES WILL BE DELETED BECAUSE THE
QUALIFICATION
FOR THESE FIELDS WILL BE DONE AT THE INTERNAL/DATA BASE
LEVEL AND THE FIELDS WILL NOT HAVE TO BE RETRIEVED FOR
QUALIFICATION AT THE CONCEPTUAL LEVEL.

11/89 - fix put in for a situation where an entry on the is,
cs, es
action lists was moved up from the qualify list, and is
involved in both a type 2 and a type 7 (or 4) action.

ARGUMENTS:

IS-ACTION-LIST RECRD
IS-QUALIFY-LIST RECRD
CS-ACTION-LIST RECRD
CS-QUALIFY-LIST RECRD
RFT RECRD
ES-ACTION-LIST RECRD
ES-QUALIFY-LIST RECRD
RET-STATUS DSPLY[X(5)]

INCLUDE FILES:

CHKCDM
ERRCDM
ESAL
ESQUAL
CSAL
CSQUAL
ISAL
ISQUAL
RFTABLE
ERRPRO

ROUTINES CALLED:

ERRPRO

DOCGROUP PS41232 Module Documentation

NAME: CDPRE6
PURPOSE: SELECT INTERNAL SCHEMA ACCESS PATH
LANGUAGE: VAX-11 COBOL
SOURCE FILE: CDPRE6
SOURCE FILE TYPE: PCO
HOST:
SUBSYSTEM: CDM
SUBDIRECTORY: NDML

DESCRIPTION:

- SELECT AN ACCESS PATH THRU A CODSYL
DATABASE TO SATISFY AN NDML QUERY

```
if isq-eval-flag =
0 : not evaluatable
1 : evaluatable, only "AND" logic
2 : evaluatable, "OR" present, same rtno same dfno's
3 : evaluatable, "OR" present, same rtno different dfno's
4 : evaluatable, "OR" present, different rtno's
if case-type =
(determined in this order)
6 : type 2e or 2i, matching subtrans, isq-eval-flag = 4
1 : type 2e or 2i, matching subtrans, either no where clause,
or nothing evaluatable
2 : type 2e or 2i, matching subtrans, not key port
isq-eval-flag = 0,1 only; at least one 1
3 : type 2e or 2i, matching subtrans, key-port > 0
4 : type 2e or 2i, matching subtrans, key-port > 0,
matching key-port, isq-eval-flag = 1,2, or 3
with at least one 2 or 3 and no isq-eval-flags
greater than 3
5 : type 2e or 2i, matching subtrans, not key port
no isq-eval-flag > 3
```

SPR 735 - CORRECTION OF KEY-PORT SELECTION. BUILD SET CHAINS TO FIND FURTHEST FROM TOP RATHER THAN THE INVALID RECURSION WHICH RETURNED CLOSEST TO TOP. 5-10-89

- All entries in the IS-ACTION are processed. Only type 2 and type 3 entries from the IS-QUALIFY are processed. Not all entries in the set table necessarily map to the IS and ISQ tables.

ARGUMENTS:

DBID	DSPLY[9(6)]
ROJ-INSDEL-RPSUB	DSPLY[X(30)]
ROJ-MODIFY-RPSUB	DSPLY[X(30)]
SUB-ID	DSPLY[9(3)]
SUBTRANS-BOOLEAN-LIST	RECRD
IS-ACTION-LIST	RECRD
IS-QUALIFY-LIST	RECRD
SET-TABLE	RECRD
FCB-E	DSPLY[S9(9)]
OCCURS-TABLE	RECRD
COMPLEX-MAPPING-ALG-TABLE	RECRD
CS-ACTION-LIST	RECRD
CS-QUALIFY-LIST	RECRD
ACCESS-PATHS	RECRD
RECORD-KEY-TABLE	RECRD
AP-INFO-TABLE	RECRD
QCS-CDMP-CHECK-STATUS	DSPLY[X(5)]

INCLUDE FILES:

APGRP
ERRCDM
ERRFS
EOD
SUBBOOL
CMAT
ISAL

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ISQUAL
CSQUAL
CSAL
SETTAB
CHKCDM
APAT
APINFO
APRK
OCCTAB
ERRPRO

ROUTINES CALLED:

CDPR7KY
RPTERR
SQLSCA
SQLBS1
SQLSCH
SQLSCC
SQLTOC
SQLSQS
SQLADR
SQLAB1
SQLEXE
SQLAD1
SQLFCH
SQLCLS
ERRPRO

DOCGROUP PS41232 Module Documentation

NAME: P5ALGID

PURPOSE: Get the CS IS complex mapping algorithm id given the

LANGUAGE: VAX-11 COBOL

SOURCE FILE: P5ALGID

SOURCE FILE TYPE: PCO

HOST:

SUBSYSTEM: CDM

SUBDIRECTORY: NDML

DESCRIPTION:

Two slightly different nested selects are used in this routine. The first select queries COMPLEX_MAPPING_PARM and DATA_FIELD. If nothing is returned from the first select, then the algorithm maps to a record type instead of data fields, so the second nested select is executed which queries COMPLEX_MAPPING_PARM and RECORD_TYPE.

ARGUMENTS:

TAG-NO	DSPLY[9(6)]
ALG-USE-CODE	DSPLY[X(1)]
DB-ID	DSPLY[9(6)]
RT-ID	DSPLY[X(30)]
RT-NO	DSPLY[9(6)]
MOD-ID	DSPLY[X(10)]
MOD-INSTANCE	DSPLY[9(3)]
LANG-NAME	DSPLY[X(10)]
RET-STATUS	DSPLY[X(5)]

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INCLUDE FILES:

ERRCDM
EOD
ERRPRO

ROUTINES CALLED:

SQLSCA
SQLBS1
SQLSCH
SQLSCC
SQLTOC
SQLOSQ
SQLADR
SQLAB1
SQLEXE
SQLAD1
SQLFCH
SQLCLS
ERRPRO

DOCGROUP PS41232 Module Documentation

NAME: P5AUCST

PURPOSE: P5AUCST finds the AUC to set value mapping (if any)

LANGUAGE: VAX-11 COBOL

SOURCE FILE: P5AUCST

SOURCE FILE TYPE: PCO

HOST:

SUBSYSTEM: CDM

SUBDIRECTORY: NDML

DESCRIPTION:

-
E135 (AUC_ST_MAPPING) is queried using TAG_NO (innermost select). The DB_ID and SET_ID returned are used in the outermost select against E72 (RECORD_SET), E134 (SET_TYPE_MEMBER) and E66 (RECORD_TYPE) to retrieve the set owner and set members for each SET_ID. The SET-TABLE is populated from the information returned in the outermost select.
Each row of data returned by the select is stored in the TEMP-SET-LIST table and is used by the calling routine to add set info to either the IS-ACTION or the IS-QUALIFY.

ARGUMENTS:

TAG-NO	DSPLY[9(6)]
DB-ID-IN	DS: Y[9(6)]
RT-ID	DSPLY[X(30)]
FCB-E	DSPLY[S9(9)]
SET-TABLE	RECRD
TEMP-SET-LIST	RECRD
RET-STATUS	DSPLY[X(5)]

INCLUDE FILES:

ERRCDM
ERRFS
EOD
SETTAB
P5TMPST
ERRPRO

ROUTINES CALLED:

SQLSCA
SQLBS1
SQLSCH
SQLSCC
SQLTOC
SQLOSQ
SQLADR
SQLAB1
SQLEXE
SQLAD1
SQLFCH
P5SETTB
SQLCLS
RPTERR
ERRPRO

DOCGROUP PS41232 Module Documentation

NAME: P5CMA

PURPOSE: P5CMA selects all the parameters for given complex

LANGUAGE: VAX-11 COBOL

SOURCE FILE: P5CMA

SOURCE FILE TYPE: PCO

HOST:

SUBSYSTEM: CDM

SUBDIRECTORY: NDML

DESCRIPTION:

-

ARGUMENTS:

DBID	DSPLY[9(6)]
RTID	DSPLY[X(30)]
RTNO	DSPLY[9(6)]
ALG-USE-CODE	DSPLY[X]
MOD-ID	DSPLY[X(10)]
MOD-INSTANCE	DSPLY[9(3)]
LANG-NAME	DSPLY[X(10)]
COMPLEX-MAPPING-ALG-TABLE	RECRD
FCB-E	DSPLY[S9(9)]
RET-STATUS	DSPLY[X(5)]

INCLUDE FILES:

ERRCDM
ERRFS
P5EDFT

EOD
CMAT
ERRPRO

ROUTINES CALLED:

SQLSCA
SQLBS1
SQLSCH
SQLSCC
SQLTOC
SQLOSQ
SQLADR
SQLAB1
SQLEXE
SQLCLS
P5EDF
SQLAD1
SQLFCH
P5CMATS
SQLTFL
SQLOPN
P5DT
P5DFDT
RPTERR
ERRPRO

DOCGROUP PS41232 Module Documentation

NAME: P5CMATS

PURPOSE: Get the type, size and nd for a complex mapping parm

LANGUAGE: VAX-11 COBOL

SOURCE FILE: P5CMATS

SOURCE FILE TYPE: PCO

HOST:

SUBSYSTEM: CDM

SUBDIRECTORY: NDML

DESCRIPTION:

-
Accesses E59 (MODULE_PARAMETER)

ARGUMENTS:

MOD-ID	DSPLY[X(10)]
PARM-ID	DSPLY[9(2)]
ERROR-FILE	DSPLY[X(30)]
DATATYPE-NAME	DSPLY[X(30)]
RET-STATUS	DSPLY[X(5)]

INCLUDE FILES:

ERRCDM
ERRPRO

ROUTINES CALLED:

SQLSCA

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SQLBS1
SQLSCH
SQLSCC
SQLTFL
SQLOPN
SQLOSQ
SQLADR
SQLAB1
SQLEXE
SQLAD1
SQLFCH
ERRPRO

DOCGROUP PS41232 Module Documentation

NAME: P5DF1

PURPOSE: Get the Data Field information and DATA-TYPE-NAME

LANGUAGE: VAX-11 COBOL

SOURCE FILE: P5DF1

SOURCE FILE TYPE: PCO

HOST:

SUBSYSTEM: CDM

SUBDIRECTORY: NDML

DESCRIPTION:

-
The Oracle select joins E108 (PROJECT_DATA_FIELD) and
E67 (DATA_FIELD).

ARGUMENTS:

TAG-NO	DSPLY[9(6)]
DB-ID	DSPLY[9(6)]
RT-ID	DSPLY[X(30)]
DF-ID	DSPLY[X(30)]
DF-NO	DSPLY[9(6)]
NUM-OCCURS	DSPLY[9(6)]
DBMS-ACCESS	DSPLY[X]
INDEX-IND	DSPLY[X]
COMP-DFNO	DSPLY[9(6)]
OCCURS-DEP-DFNO	DSPLY[9(6)]
INDEX-DFNO	DSPLY[9(6)]
DATA-TYPE-NAME	DSPLY[X(30)]
RET-STATUS	DSPLY[X(5)]

INCLUDE FILES:

ERRCDM
EOD
ERRPRO

ROUTINES CALLED:

SQLSCA
SQLBS1
SQLSCH
SQLSCC
SQLTFL
SQLOPN
SQLOSQ
SQLADR
SQLAB1
SQLEXE
SQLAD1
SQLFCH
ERRPRO

DOCGROUP PS41232 Module Documentation

NAME: P5DFDT

PURPOSE: P5DFDT returns DFID,TYPE, SIZE and ND given the DFNO.

LANGUAGE: VAX-11 COBOL

SOURCE FILE: P5DFDT

SOURCE FILE TYPE: PCO

HOST:

SUBSYSTEM: CDM

SUBDIRECTORY: NDML

DESCRIPTION:

The Oracle select queries E67 (DATA_FIELD). If the data field has a data type, the routine returns TYPE, SIZE and ND, and sets DATATYPE-IND to 1. If the dat field does not have a data type, DATATYPE-IND is set to 0 and the input type, size and nd are left unchanged.

ARGUMENTS:

DF-NO	DSPLY[9(6)]
DF-TYPE	DSPLY[X]
DF-SIZE	DSPLY[9(3)]
DF-ND	DSPLY[9(2)]
DF-ID	DSPLY[X(30)]
DATATYPE-IND	DSPLY[9]
RET-STATUS	DSPLY[X(5)]

INCLUDE FILES:

ERRCDM
EOD
ERRPRO

ROUTINES CALLED:

SQLSCA
SQLBS1
SQLSCH
SQLSCC
SQLTFL
SQLOPN
SQLOSQ
SQLADR
SQLAB1
SQLEXE
SQLAD1
SQLFCH
P5DT
ERRPRO

DOCGROUP PS41232 Module Documentation

NAME: P5DT

PURPOSE: Get the type, size and nd for a data field given the

LANGUAGE: VAX-11 COBOL

SOURCE FILE: P5DT

SOURCE FILE TYPE: PCO

HOST:

SUBSYSTEM: CDM

SUBDIRECTORY: NDML

DESCRIPTION:

-
Accesses E95 (USER_DEF_DATA_TYPE)

ARGUMENTS:

DB-ID DSPLY[9(6)]
RT-ID DSPLY[X(30)]
DF-ID DSPLY[X(30)]
DATA-TYPE-NAME DSPLY[X(30)]
DT-TYPE DSPLY[X]
DT-SIZE DSPLY[9(3)]
DT-ND DSPLY[99]
RET-STATUS DSPLY[X(5)]

INCLUDE FILES:

ERRCDM
EOD
ERRPRO

ROUTINES CALLED:

SQLSCA
SQLBS1
SQLSCH
SQLSCC
SQLTFL
SQLOPN
SQLOSQ
SQLADR
SQLAB1
SQLEXE
SQLAD1
SQLFCH
ERRPRO

DOCGROUP PS41232 Module Documentation

NAME: P5ECHP

PURPOSE: DETERMINE IF AN ENTITY IS HORIZONTALLY PARTITIONED.

LANGUAGE: VAX-11 COBOL

SOURCE FILE: P5ECHP

SOURCE FILE TYPE: PCO

HOST:

SUBSYSTEM: CDM

SUBDIRECTORY: NDML

DESCRIPTION:

- QUERY E163(HORIZONTAL_PART) TO
DETERMINE THE RT_NO AND HP_NO GIVEN AN EC_NO.

-

ARGUMENTS:

EC-NO DSPLY[9(6)]
EC-HP-FLAG DSPLY[9]
FCB-E DSPLY[S9(9)]
RET-STATUS DSPLY X(5)

INCLUDE FILES:

CHKCDM
ERRCDM
ERRFS
EOD
ERRPRO

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ROUTINES CALLED:

SQLSCA
SQLBS1
SQLSCH
SQLSCC
SQLTOC
SQLOSQ
SQLADR
SQLAB1
SQLEXE
SQLAD1
SQLFCH
SQLCLS
RPTERR
ERRPRO

DOCGROUP PS41232 Module Documentation

NAME: P5EDF
PURPOSE: P5EDF RETRIEVES ALL THE ELEMENTARY DATA FIELDS FOR
LANGUAGE: VAX-11 COBOL
SOURCE FILE: P5EDF
SOURCE FILE TYPE: PCO
HOST:
SUBSYSTEM: CDM
SUBDIRECTORY: NDML

DESCRIPTION:

ARGUMENTS:

DBID	DSPLY[9(6)]
RTID	DSPLY[X(30)]
RTNO	DSPLY[9(6)]
FCB-E	DSPLY[S9(9)]
EDF-TABLE	RECRD
RET-STATUS	DSPLY[X(5)]

INCLUDE FILES:

ERRCDM
ERRFS
EOD
P5EDFT
ERRPRO

ROUTINES CALLED:

SQLSCA
SQLBS1
SQLSCH
SQLSCC
SQLTOC
SQLOSQ
SQLADR
SQLAB1
SQLEXE
SQLCLS
SQLAD1
SQLFCH
SQLTFL
SQLOPN
ERRPRO
RPTERR

DOCGROUP PS41232 Module Documentation

NAME: P5EINFO
PURPOSE: UPDATE THE P5ECINF TABLE.
LANGUAGE: VAX-11 COBOL
SOURCE FILE: P5EINFO
SOURCE FILE TYPE: COB
HOST:
SUBSYSTEM: CDM
SUBDIRECTORY: NDML

DESCRIPTION:

- THIS MODULE WILL CALL TWO ROUTINES
TO GET ENTITY INFORMATION FOR THE P5ECINF TABLE.
"P5ECHP" WILL BE CALLED TO DETERMINE IF AN ENTITY
IS HORIZONTALLY PARTITIONED. "P5RULES" WILL BE CALLED
TO GET RETRIEVAL/UPDATE RULES FOR THE ENTITY.

new code 4/89 for ge imip
IT WILL ALSO CALL "ROJCHK" TO SEE IF THIS ENTITY IS
PART OF A RECORD OUTER JOIN, AND IF IT IS WILL GET THE
CARDINALITY OF THE RELATION AND MARK IF THIS IS THE
INDEPENDENT OR DEPENDENT ENTITY IN THAT RELATION.

ARGUMENTS:

EC-INFO-TBL	RECRD
ROJ-INFO-TABLE	RECRD
FCB-E	DSPLY[S9(9)]
RET-STATUS	DSPLY[X(5)]

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INCLUDE FILES:

CHKCDM
ERRCDM
ERRFS
P5ECINF
P5ROJ
ERRPRO

ROUTINES CALLED:

ROJCHK
P5ECHP
P5RULES
ERRPRO

DOCGROUP PS41232 Module Documentation

NAME: P5HOST

PURPOSE: P5HOST returns the on-host mappings (if any) to dbid

LANGUAGE: VAX-11 COBOL

SOURCE FILE: P5HOST

SOURCE FILE TYPE: PCO

HOST:

SUBSYSTEM: CDM

SUBDIRECTORY: NDML

DESCRIPTION:

- The Oracle select joins E147 (AUC_IS_MAPPING) ,
E66 (RECORD_TYPE) and E24 (DATA_BASE) .

-

ARGUMENTS:

TARGET-HOST DSPLY[X(3)]
TAG-NO DSPLY[9(6)]
AUCISM-LIST RECRD
ENTRY-STATUS DSPLY[9]
FCB-E DSPLY[S9(9)]
RET-STATUS DSPLY[X(5)]

INCLUDE FILES:

ERRCDM
ERRFS
REDDAT
EOD
P5AUCIS

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ERRPRO

ROUTINES CALLED:

SQLSCA
SQLBS1
SQLSCH
SQLSCC
SQLTOC
SQLOSQ
SQLADR
SQLAB1
SQLEXE
SQLAD1
SQLFCH
SQLCLS
RPTERR
ERRPRO

DOCGROUP PS41232 Module Documentation

NAME: P5HP
PURPOSE: Builds AUCISM-LIST entries for a horizontally
partitioned entity.
LANGUAGE: VAX-11 COBOL
SOURCE FILE: P5HP
SOURCE FILE TYPE: PCO
HOST:
SUBSYSTEM: CDM
SUBDIRECTORY: NDML

DESCRIPTION:

Select the AUCISM mappings for all members of this partition from E163 (HORIZONTAL_PART), E147 (AUC_IS_MAPPING) and E66 (RECORD_TYPE) given the EC-NO and RT NO.

NOTE: NDDL guarantees that a given RT_NO won't exist in more than 1 partition (HP_NO) and that all partition members have the same PREF_NO.

NOTE: This routine will only be called if the EC-INFO-TBL had the horizontally-partitioned flag set for this entity.

ARGUMENTS:

AUCIS-M-LIST	RECRD
FCB- <u>E</u>	DSPLY[S9(9)]
RET-STATUS	DSPLY[X(5)]

INCLUDE FILES:

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ERRCDM
ERRFS
REDDAT
EOD
P5AUCIS
ERRPRO

ROUTINES CALLED:

SQLSCA
SQLBS1
SQLSCH
SQLSCC
SQLTOC
SQLOSQ
SQLADR
SQLAB1
SQLEXE
SQLCLS
SQLAD1
SQLFCH
RPTERR
ERRPRO

DOCGROUP PS41232 Module Documentation

NAME: P5IAUC

PURPOSE: This routine returns the "owner" tag-no, ec-no and

LANGUAGE: VAX-11 COBOL

SOURCE FILE: P5IAUC

SOURCE FILE TYPE: PCO

HOST:

SUBSYSTEM: CDM

SUBDIRECTORY: NDML

DESCRIPTION:

Uses the inherited tag-no to access E7 (INHERITED_ATT_USE and then joins E5 (ATTRIBUTE_USE_CL) and E7 on the tag-no of the key-class member.

ARGUMENTS:

TAG-NO	DSPLY[9(6)]
KCM-TAG-NO	DSPLY[9(6)]
RC-NO	DSPLY[9(6)]
KCM-EC-NO	DSPLY[9(6)]
RET-STATUS	DSPLY[X(5)]

INCLUDE FILES:

CHKCDM
ERRCDM
EOD
ERRPRO

ROUTINES CALLED:

SQLSCA
SQLBS1
SQLSCH
SQLSCC
SQLTFL
SQLOPN
SQLOSQ
SQLADR
SQLAB1
SQLEXE
SQLAD1
SQLFCH
ERRPRO

DOCGROUP PS41232 Module Documentation

NAME: P5KCM

PURPOSE: P5KCM determines if a tag is a member of a key class

LANGUAGE: VAX-11 COBOL

SOURCE FILE: P5KCM

SOURCE FILE TYPE: PCO

HOST:

SUBSYSTEM: CDM

SUBDIRECTORY: NDML

DESCRIPTION:

- Queries E6 (KEY CLASS MEMBER) using TAG-NO
to find the KC-NO(s). For each KC-NO, queries E6
again to find all the key class members of that key,
and then populates the tables.

ARGUMENTS:

TAG-NO	DSPLY[9(6)]
DB-ID	DSPLY[9(6)]
RT-ID	DSPLY[X(30)]
RT-NO	DSPLY[9(6)]
DF-ID	DSPLY[X(30)]
DF-NO	DSPLY[9(6)]
DT-TYPE	DSPLY[X]
DT-SIZE	DSPLY[9(3)]
DT-ND	DSPLY[9(2)]
IS-ISQ-PTR	DSPLY[9(3)]
CSQ-LEFT-RIGHT	DSPLY[X]
FCB-E	DSPLY[S9(9)]
REPL-JOIN-LIST	RECRD

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TEMP-KEY-LIST	RECRD
KEY-JOIN-LIST	RECRD
RET-STATUS	DSPLY[X(5)]

INCLUDE FILES:

ERRCDM
ERRFS
EOD
REPLJN
P5TMPKY
P5KEYJN
ERRPRO

ROUTINES CALLED:

SQLSCA
SQLBS1
SQLSCH
SQLSCC
SQLTOC
SQLOSQ
SQLADR
SQLAB1
SQLEXE
SQLCLS
SQLAD1
SQLFCH
RPTERR
ERRPRO

DOCGROUP PS41232 Module Documentation

NAME: P5MAPAL

PURPOSE: P5MAPAL returns the mappings (if any) to dbid

LANGUAGE: VAX-11 COBOL

SOURCE FILE: P5MAPAL

SOURCE FILE TYPE: PCO

HOST:

SUBSYSTEM: CDM

SUBDIRECTORY: NDML

DESCRIPTION:

- The Oracle select joins E147 (AUC_IS_MAPPING)
and E66 (RECORD_TYPE).

-

ARGUMENTS:

TAG-NO	DSPLY[9(6)]
AUCISM-LIST	RECRD
IS-ACTION	DSPLY[X]
ENTRY-STATUS	DSPLY[9]
LIST-FLAG	DSPLY[X]
FCB-E	DSPLY[S9(9)]
RET-STATUS	DSPLY[X(5)]

INCLUDE FILES:

ERRCDM
ERRFS
REDDAT
EOD

P5AUCIS
ERRPRO

ROUTINES CALLED:

SQLSCA
SQLBS1
SQLSCH
SQLSCC
SQLTOC
SQLOSQ
SQLADR
SQLAB1
SQLEXE
SQLAD1
SQLFCH
SQLCLS
RPTERR
ERRPRO

DOCGROUP PS41232 Module Documentation

NAME: P5PRIM

PURPOSE: P5PRIM returns the mappings (if any) to dbid

LANGUAGE: VAX-11 COBOL

SOURCE FILE: P5PRIM

SOURCE FILE TYPE: PCO

HOST:

SUBSYSTEM: CDM

SUBDIRECTORY: NDML

DESCRIPTION:

- The Oracle select joins E147 (AUC_IS_MAPPING)
and E66 (RECORD_TYPE).
-

ARGUMENTS:

TAG-NO DSPLY[9(6)]
AUCISM-LIST RLCRD
ENTRY-STATUS DSPLY[9]
FCB-E DSPLY[S9(9)]
RET-STATUS DSPLY[X(5)]

INCLUDE FILES:

ERRCDM
ERRFS
REDDAT
EOD
P5AUCIS
ERRPRO

ROUTINES CALLED:

SQLSCA
SQLBS1
SQLSCH
SQLSCC
SQLTOC
SQLOSQ
SQLADR
SQLAB1
SQLEXE
SQLAD1
SQLFCH
SQLCLS
RPTERR
ERRPRO

DOCGROUP PS41232 Module Documentation

NAME: P5RCSTM

PURPOSE: P5RCSTM finds the relation class to set mapping (if any)

LANGUAGE: VAX-11 COBOL

SOURCE FILE: P5RCSTM

SOURCE FILE TYPE: PCO

HOST:

SUBSYSTEM: CDM

SUBDIRECTORY: NDML

DESCRIPTION:

-

E109 (RC_BASED_REC_SET) is queried using RC-NO to determine if a mapping to a set member exists. If it does, the DB_ID and SET_ID returned by the innermost query are used as the principal join criteria in the outermost query against E72 (RECORD_SET), E134 (SET_TYPE_MEMBER) and E66 (RECORD_TYPE), which returns the set owner and all its members.

ARGUMENTS:

RC-NO	DSPLY[9(6)]
SET-TABLE	RECRD
FCB-E	DSPLY[S9(9)]
RET-STATUS	DSPLY[X(5)]

INCLUDE FILES:

P5TMPST
ERRCDM

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EOD
SETTAB
ERRPRO

ROUTINES CALLED:

SQLSCA
SQLBS1
SQLSCH
SQLSCC
SQLTOC
SQLSQS
SQLADR
SQLAB1
SQLEXE
SQLAD1
SQLFCH
P5SETTB
SQLCLS
RPTERR
ERRPRO

DOCGROUP PS41232 Module Documentation

NAME: P5RDF

PURPOSE: P5RDF gets the mappings for repeating fields and for

LANGUAGE: VAX-11 COBOL

SOURCE FILE: P5RDF

SOURCE FILE TYPE: PCO

HOST:

SUBSYSTEM: CDM

SUBDIRECTORY: NDML

DESCRIPTION:

- Depending upon when P5RDF is called, the existence of repeating fields/groups may or may not be legal. RDF-LEGAL-FLAG indicates whether or not repeating fields are legal. MAPPED-TO-FLAG indicates whether the repeating field/group was actually selected or is needed in order to insert nulls into those fields during an insert or delete action.

ARGUMENTS:

DBID	DSPLY[9(6)]
RTID	DSPLY[X(30)]
RTNO	DSPLY[9(6)]
DFID	DSPLY[X(30)]
DFNO	DSPLY[9(6)]
RDF-LEGAL-FLAG	DSPLY[X]
MAPPED-TO-FLAG	DSPLY[X]
FCB-E	DSPLY[S9(9)]
DF-REPEAT-FLAG	DSPLY[X]
TEMP-OCCURS-TABLE	RECRD

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RET-STATUS DSPLY[X(5)]

INCLUDE FILES:

ERRCDM
ERRFS
EOD
P5TOT
ERRPRO

ROUTINES CALLED:

SQLSCA
SQLBS1
SQLSCH
SQLSCC
SQLTFL
SQLOPN
SQLOSQ
SQLADR
SQLAB1
SQLEXE
SQLAD1
SQLFCH
RPTERR
ERRPRO

DOCGROUP PS41232 Module Documentation

NAME: P5RULES

PURPOSE: DETERMINE UPDATE/RETRIEVAL RULES FOR AN ENTITY.

LANGUAGE: VAX-11 COBOL

SOURCE FILE: P5RULES

SOURCE FILE TYPE: PCO

HOST:

SUBSYSTEM: CDM

SUBDIRECTORY: NDML

DESCRIPTION:

- QUERY E1014 (DISTRIBUTED RULES) GIVEN
EC_NO TO DETERMINE DISTR_UPDT_RULE AND
DISTR_RETR_RULE.

ARGUMENTS:

EC-NO	DSPLY[9(6)]
EC-RETRIEVE-RULE	DSPLY[XX]
EC-UPDATE-RULE	DSPLY[XX]
FCB-E	DSPLY[S9(9)]
RET-STATUS	DSPLY[X(5)]

INCLUDE FILES:

CHKCDM
ERRCDM
ERRFS
EOD
ERRPRO

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ROUTINES CALLED:

SQLSCA
SQLBS1
SQLSCH
SQLSCC
SQLTFL
SQLOPN
SQLOSQ
SQLADR
SQLAB1
SQLEXE
SQLAD1
SQLFCH
RPTERR
ERRPRO

DOCGROUP PS41232 Module Documentation

NAME: P5SETTB

PURPOSE: P5SETTB populates one or more rows in the SET-TABLE

LANGUAGE: VAX-11 COBOL

SOURCE FILE: P5SETTB

SOURCE FILE TYPE: COB

HOST:

SUBSYSTEM: CDM

SUBDIRECTORY: NDML

DESCRIPTION:

-

ARGUMENTS:

TEMP-SET-LIST

RECRD

SET-TABLE

RECRD

FCB-E

DSPLY[S9(9)]

RET-STATUS

DSPLY[X(5)]

INCLUDE FILES:

ERRCDM

ERRF5

P5TMPST

SETTAB

ERRPRO

ROUTINES CALLED:

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RPTERR
ERRPRO

DOCGROUP PS41232 Module Documentation

NAME: P5UNION

PURPOSE: P5UNION returns the union discriminator data fields,
the

LANGUAGE: VAX-11 COBOL

SOURCE FILE: P5UNION

SOURCE FILE TYPE: PCO

HOST:

SUBSYSTEM: CDM

SUBDIRECTORY: NDML

DESCRIPTION:

MODIFIED : 19 jan 1987

REASON : input to p5union is EC-NO, not db-id, rt-id and
rt-no.

ARGUMENTS:

EC-NO	DSPLY[9(6)]
CS-ACTION	DSPLY[X]
FCB-E	DSPLY[S9(9)]
UEC-TABLE	RECRD
RET-STATUS	DSPLY[X(5)]

INCLUDE FILES:

ERRCDM
ERRFS
EOD
P5UEC

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ERRPRO

ROUTINES CALLED:

SQLSCA
SQLBS1
SQLSCH
SQLSCC
SQLTOC
SQLOSQ
SQLADR
SQLAB1
SQLEXE
SQLCLS
SQLAD1
SQLFCH
P5DT
RPTERR
ERRPRO

DOCGROUP PS41232 Module Documentation

NAME: P5UPD
PURPOSE: DETFRMINE VALIDITY OF NDML UPDATE STATEMENT
LANGUAGE: VAX-11 COBOL
SOURCE FILE: P5UPD
SOURCE FILE TYPE: COB
HOST:
SUBSYSTEM: CDM
SUBDIRECTORY: NDML

DESCRIPTION:

-
this routine is called by function pre5 to verify
ndml delete and modify transactions are updatable.
when the conceptual schema has mappings for multiple
preferences, this results in distributed update.
this module verifies that the records being updated
has the necessary qualification logic for all
subtransactions.

- 1) validate type 2 is-qualify entries.
all type 2 qualifications of an entity must be
represented in each record mapping being updated.
- 2) validate type 3 is-qualify entries (that are a
result of delete or modify.. using actions)
each using entity must map to the same database
being updated and must be connected by a join or a set.

ARGUMENTS:

USING-ENTITY-STATUS DSPLY[9]
CS-ACTION-LIST RECRD
CS-QUALIFY-LIST RECRD

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IS-ACTION-LIST	RECRD
IS-QUALIFY-LIST	RECRD
SUBTRANS-PROCESS-ID-TABLE	RECRD
COMPLEX-MAPPING-ALG-TABLE	RECRD
SET-TABLE	RECRD
FCB-E	DSPLY[S9(9)]
RET-STATUS	DSPLY[X(5)]

INCLUDE FILES:

CHKCDM
ERRCDM
ERRFS
CSAL
CSQUAL
ISAL
ISQUAL
SUBPROC
CMAT
SETTAB
ERRPRO

ROUTINES CALLED:

CDGTN
RPTERR
ERRPRO

3.10.5 Include File Descriptions

The following list contains a purpose and description of each include file in the documentation group as specified in the source code. The language it is written in is also given.

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DOCGROUP PS41232 Include File Description

FILE NAME: APAT
PURPOSE: ACCESS PATH TABLE
LANGUAGE: VAX-11 COBOL

DESCRIPTION:

CONTAINS THE ACCESS PATH FOR ONE SUBTRANSACTION
FOR A NDML REQUEST.

DOCGROUP PS41232 Include File Description

FILE NAME: APGRP
PURPOSE: RTID GROUPING TABLE
LANGUAGE: VAX-11 COBOL

DESCRIPTION:

Definition of the GROUP-TABLE local to the
Access Path Selector routines. Contains
each unique RTID for a given subtransaction.

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DOCGROUP PS41232 Include File Description

FILE NAME: APINFO
PURPOSE: ACCESS PATH INFORMATION TABLE
LANGUAGE: VAX-11 COBOL

DESCRIPTION:

THIS IS A COLLECTION OF INFORMATION STORED IN A
NUMBER OF VARIOUS TABLES USED BY THE ACCESS PATH TABLE
AND THE GENERIC CODASYL TABLE. SEE CDMP SPEC, PRE6

APINFO.INC

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DOCGROUP PS41232 Include File Description

FILE NAME: APRK
PURPOSE: TABLE OF RECORD KEYS FOR CODASYL ACCESS PATHS
LANGUAGE: VAX-11 COBOL

DESCRIPTION:

CONTAINS INFORMATION FOR THE KEYS OF
RECORDS CONTAINED IN THE CURRENT ACCESS
PATH

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DOCGROUP PS41232 Include File Description

FILE NAME: BOOLST
PURPOSE: BOOLEAN LIST
LANGUAGE: VAX-11 COBOL

DESCRIPTION:

CONTAINS THE BOOLEAN OPERATORS, PARENTHESES, AND
POINTERS TO THE TYPE 2 CONDITIONS FOR AN NDML
TRANSACTION

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DOCGROUP PS41232 Include File Description

FILE NAME: CHKCDB
PURPOSE: IISS CDMP CHECK STATUS CODES
LANGUAGE: VAX-11 COBOL

DESCRIPTION:

CONTAINS ALL STATUS CODES FOR THE *
CDMP MODULES *

DOCGROUP PS41232 Include File Description

FILE NAME: CMAT
PURPOSE: COMPLEX MAPPING ALGORITHM TABLE
LANGUAGE: VAX-11 COBOL

DESCRIPTION:

THIS TABLE IDENTIFIES THE SOFTWARE MODULES AND
PARAMETERS THAT ARE NEEDED TO PERFORM COMPLEX
MAPPINGS BETWEEN CS AND IS FORMATS

DOCGROUP PS41232 Include File Description

FILE NAME: CSAL
PURPOSE: CONCEPTUAL SCHEMA ACTION LIST
LANGUAGE: VAX-11 COBOL

DESCRIPTION:

TABLE TO HOLD CONCEPTUAL DATA ABOUT THE REQUEST

NOTE!!!!!! This table is cloned in both cdpre5 and cdpre4
so any changes made to this structure needs to
be made in these cloned versions. Clone version
is CSALX for CDPRE4.

NOTE AGAIN Any changes to the CS-ACTION-ENTRY must be
reflected
in CDP10B in the C code generation section. The
length of CS-STRING2 has been hard coded in the
generated C code in paragraph
210-GEN-MOVE-OF-TABLES.

THE CONCEPTUAL SCHEMA ACTION LIST

DOCGROUP PS41232 Include File Description

FILE NAME: CSQUAL
PURPOSE: CONCEPTUAL SCHEMA QUALIFY LIST
LANGUAGE: VAX-11 COBOL

DESCRIPTION:

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DOCGROUP PS41232 Include File Description

FILE NAME: EOD
PURPOSE: SQL END OF DATA DEFINITION
LANGUAGE: VAX-11 COBOL

DESCRIPTION:

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DOCGROUP PS41232 Include File Description

FILE NAME: ERRCDM
PURPOSE: IISS ERROR STATUS CODES FOR CDMP MODULES
LANGUAGE: VAX-11 COBOL

DESCRIPTION:

CONTAINS ALL ERROR CODES USED BY CDMP *
MODULES FOR ERROR HANDLING *

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DOCGROUP PS41232 Include File Description

FILE NAME: ERRFS
PURPOSE: ERRFS.INC - FILE I/O PRIMITIVES (FILE SERVICES)
LANGUAGE: VAX-11 COBOL

DESCRIPTION:

IISS ERROR CODES

THIS FILE DEFINES THE FS STATUS
CODES IN COBOL FORMAT

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DOCGROUP PS41232 Include File Description

FILE NAME: ERRPRO
PURPOSE: PROCESS ERROR INCLUDE FILE
LANGUAGE: VAX-11 COBOL

DESCRIPTION:

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DOCGROUP PS41232 Include File Description

FILE NAME: ESAL
PURPOSE: EXTERNAL SCHEMA ACTION LIST
LANGUAGE: VAX-11 COBOL

DESCRIPTION:

CONTAINS THE EXTERNAL SCHEMA INFORMATION FOR AN
NDML REQUEST

DOCGROUP PS41232 Include File Description

FILE NAME: ESQUAL
PURPOSE: EXTERNAL SCHEMA QUALIFY LIST
LANGUAGE: VAX-11 COBOL

DESCRIPTION:

CONTAINS EXTERNAL SCHEMA INFORMATION FOR THE NDML
QUALIFICATION

THE EXTERNAL SCHEMA QUALIFY LIST

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DOCGROUP PS41232 Include File Description

FILE NAME: ISAL
PURPOSE: INTERNAL SCHEMA ACTION LIST
LANGUAGE: VAX-11 COBOL

DESCRIPTION:

CONTAINS INTERNAL SCHEMA INFORMATION ABOUT AN
NDML REQUEST

THE INTERNAL SCHEMA ACTION LIST

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DOCGROUP PS41232 Include File Description

FILE NAME: ISQUAL
PURPOSE: INTERNAL SCHEMA QUALIFY LIST
LANGUAGE: VAX-11 COBOL

DESCRIPTION:

CONTAINS INTERNAL SCHEMA INFORMATION FOR AN
NDML QUALIFICATION

THE INTERNAL SCHEMA QUALIFY LIST

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DOCGROUP PS41232 Include File Description

FILE NAME: OCCTAB
PURPOSE: OCCURS TABLE
LANGUAGE: VAX-11 COBOL

DESCRIPTION:

CONTAINS INFORMATION ABOUT THE SUBSCRIPTING
STRUCTURE FOR REPEATING FIELDS/GROUPS. THERE
MAY BE MULTIPLE ENTRIES IN THE TABLE HAVING
THE SAME SUBTRANS, RTNO AND NEST-ID.

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DOCGROUP PS41232 Include File Description

FILE NAME: P5AUCIS

PURPOSE: AUCISM-LIST contains the CS to IS mappings for a
given

LANGUAGE: VAX-11 COBOL

DESCRIPTION:

tag.

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DOCGROUP PS41232 Include File Description

FILE NAME: P5ECINF

PURPOSE: THIS TABLE CONTAINS INFORMATION ABOUT EACH UNIQUE

LANGUAGE: VAX-11 COBOL

DESCRIPTION:

ENTITY IN THE CS-ACTION-LIST. THIS INFORMATION
INCLUDES IF THE ENTITY IS HORIZONTALLY PARTITIONED
AND THE ENTITY'S RETRIEVAL/UPDATE RULES. THIS
TABLE WAS CREATED FOR RELEASE 2.3.

information added 4/89 to support record outer
join

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DOCGROUP PS41232 Include File Description

FILE NAME: P5EDFT

PURPOSE: Table to hold elementary record definition
variables.

LANGUAGE: VAX-11 COBOL

DESCRIPTION:

Similar to TDFTBL and made for P5EDF.PCO

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DOCGROUP PS41232 Include File Description

FILE NAME: P5KEYJN
PURPOSE: This table is used in conjunction with
TEMP-KEY-LIST.
LANGUAGE: VAX-11 COBOL

DESCRIPTION:

DOCGROUP PS41232 Include File Description

FILE NAME: P5ROJ
PURPOSE: THIS TABLE CONTAINS INFORMATION ABOUT EACH
LANGUAGE: VAX-11 COBOL

DESCRIPTION:

ENTITY IN THE CS-ACTION-LIST. THIS INFORMATION
INDICATES (FOR ENTITIES ENGAGED IN A RECORD OUTER
JOIN) IF IT IS THE INDEPENDENT OR DEPENDENT ENTITY,
WHAT RELATION(S) IT IS ASSOCIATED WITH, AND WHAT
CARDINALITY IT IS INVOLVED IN.

DOCGROUP PS41232 Include File Description

FILE NAME: P5TMPKY

PURPOSE: This table is used to ensure that only whole keys

LANGUAGE: VAX-11 COBOL

DESCRIPTION:

are used in forming joins using key replication.

DOCGROUP PS41232 Include File Description

FILE NAME: P5TMPST
PURPOSE: TEMP-SET-LIST contains one or more rows of set
LANGUAGE: VAX-11 COBOL

DESCRIPTION:

information retrieved by Oracle select statements.
The table is used by PRE5 routines to populate the
SET-TABLE, IS-ACTION and IS-QUALIFY lists.

DOCGROUP PS41232 Include File Description

FILE NAME: P5TOT

PURPOSE: Contains the ancestry chain for an AUC that maps

LANGUAGE: VAX-11 COBOL

DESCRIPTION:

to a repeating field or repeating group.

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DOCGROUP PS41232 Include File Description

FILE NAME: P5UEC
PURPOSE: PROCESS ERROR INCLUDE FILE
LANGUAGE: VAX-11 COBOL

DESCRIPTION:

DOCGROUP PS41232 Include File Description

FILE NAME: REDDAT

PURPOSE: This is the list of rules for Task 8016, Redundant Data.

LANGUAGE: VAX-11 COBOL

DESCRIPTION:

The variable AUCISM-FLAG from the AUCISM-LIST will be set to IS if the AUCISM entry will be used to build the IS-ACTION-LIST or the IS-QUALIFY-LIST. AUCISM-FLAG will be set to RJ if the entry will be used to build the REPL-JOIN-LIST.

CS-ACTION * Transform CS-ACTION by: * Transform CS-QUALIFY
by:

Set 'S' * If ALLOW RETRIEVAL
the or * Select highest prefer- * Select all copies.
others. 'Q' *ance copy on host, set *AUCISM-FLAG = IS for
*AUCISM-FLAG = IS. If *primary copy. Set the
*copy not found on host, *flag = RJ for all
*select the primary copy. *
*Select all other copies, *
and set AUCISM-FLAG = RJ.
* If DISALLOW RETRIEVAL
* Select the primary copy, * Select all copies.
Set the *set AUCISM-FLAG = IS. *AUCISM-FLAG = IS for
others. *Select all other copies, *primary copy. Set the
*and set the flag = RJ. *flag = RJ for all
*select the primary copy. *
*Select all other copies, *
and set AUCISM-FLAG = RJ.

Set '1', * If ALLOW RETRIEVAL
the '2', * or
* DISALLOW RETRIEVAL
* Select the primary copy * Select all copies.
*and set the AUCISM-FLAG *AUCISM-FLAG = IS for

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DOCGROUP PS41232 Include File Description

FILE NAME: REPLJN
PURPOSE: REPL-JOIN-LIST SUBTRANSACTION JOINS
LANGUAGE: VAX-11 COBOL

DESCRIPTION:

POTENTIAL INTER- AND INTRA- SUBTRANSACTION JOINS

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DOCGROUP PS41232 Include File Description

FILE NAME: RFTABLE
PURPOSE: THE RESULT FIELD TABLE
LANGUAGE: VAX-11 COBOL

DESCRIPTION:

CONTAINS CONCEPTUAL SCHEMA INFORMATION ABOUT
THE RESULTS OF AN NDML REQUEST

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DOCGROUP PS41232 Include File Description

FILE NAME: SETTAB

PURPOSE: LIST OF SETS OWNER-MEMBER RELATIONSHIPS

LANGUAGE: VAX-11 COBOL

DESCRIPTION:

SET TABLE TO KEEP TRACK OF CODASYL NDML REQUESTS
IN TERMS OF OWNER AND MEMBER RELATIONSHIPS

DOCGROUP PS41232 Include File Description

FILE NAME: SUBBOOL
PURPOSE: SUBTRANS BOOLEAN LIST
LANGUAGE: VAX-11 COBOL

DESCRIPTION:

CONTAINS ALL THE BOOLEAN OPERATORS, PARENTHESES, AND
CONDITIONS WHICH CAN BE SATISFIED AT THE INTERNAL
SCHEMA LEVEL, FOR EACH SUBTRANSACTION.

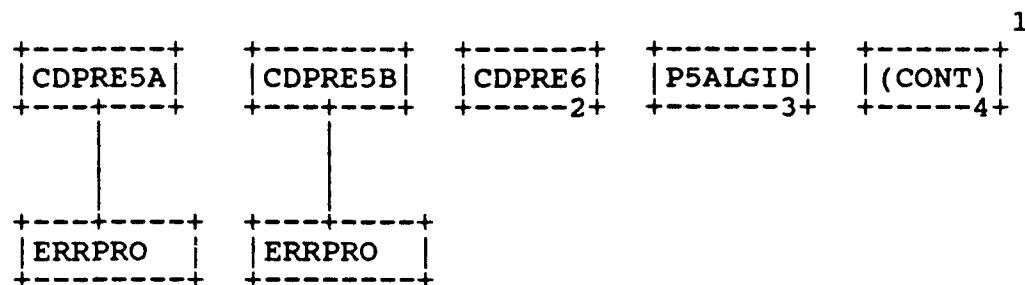
DOCGROUP PS41232 Include File Description

FILE NAME: SUBPROC
PURPOSE: SUBTRANSACTION PROCESSES ID TABLE
LANGUAGE: VAX-11 COBOL

DESCRIPTION:

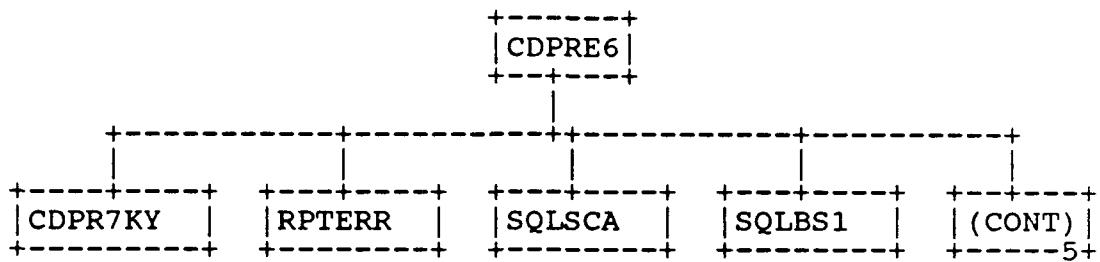
THIS TABLE MUST HAVE THE SAME NUMBER OF OCCURS
AS THE RITABLE.INC AND QITABLE.INC SINCE THEY ARE
PARALLEL
TABLES.

3.10.6 Hierarchy Chart



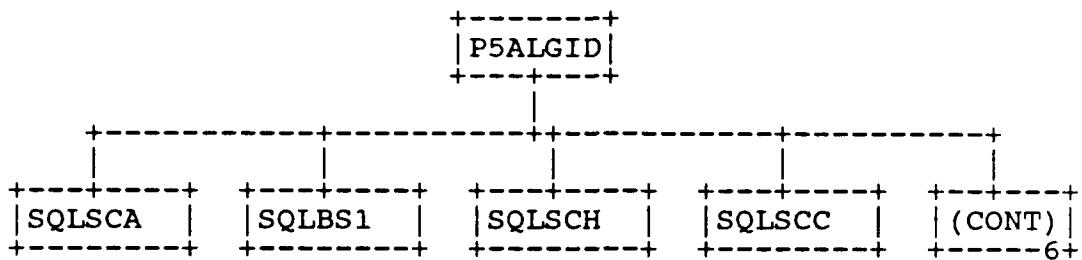
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3



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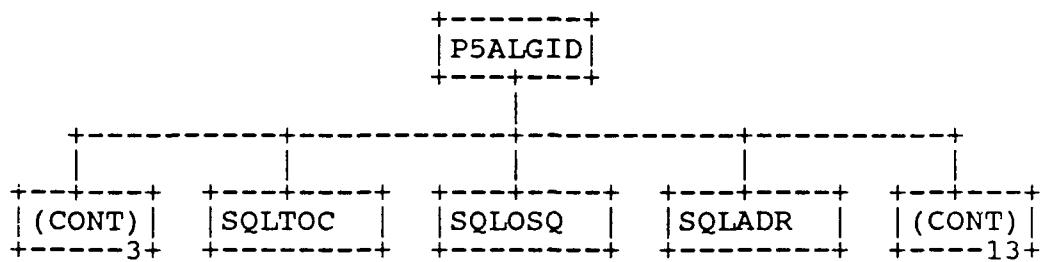
4

+(CONT)	P5AUCST	P5CMA	P5DF1	P5EINFO	(CONT)
+-----1+	+-----7+	+-----8+	+-----9+	+-----10+	+-----11+

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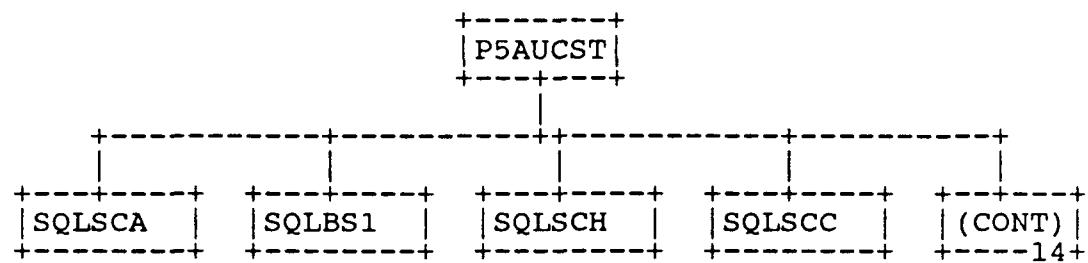
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2	SQLSCH	SQLSCC	SQLTOC	12



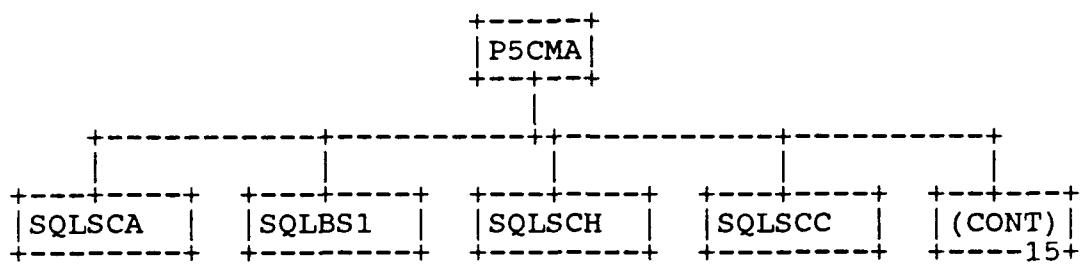
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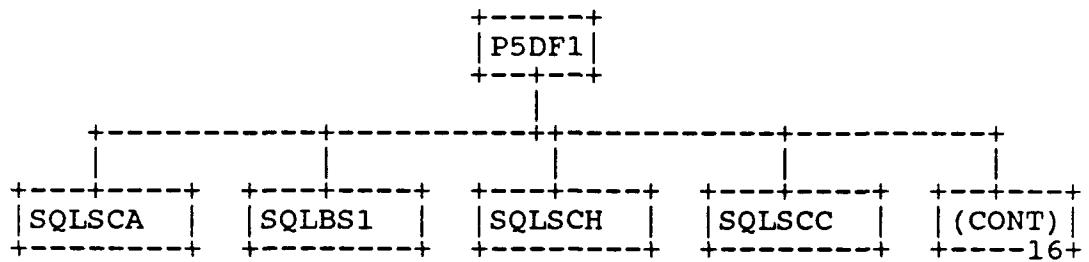
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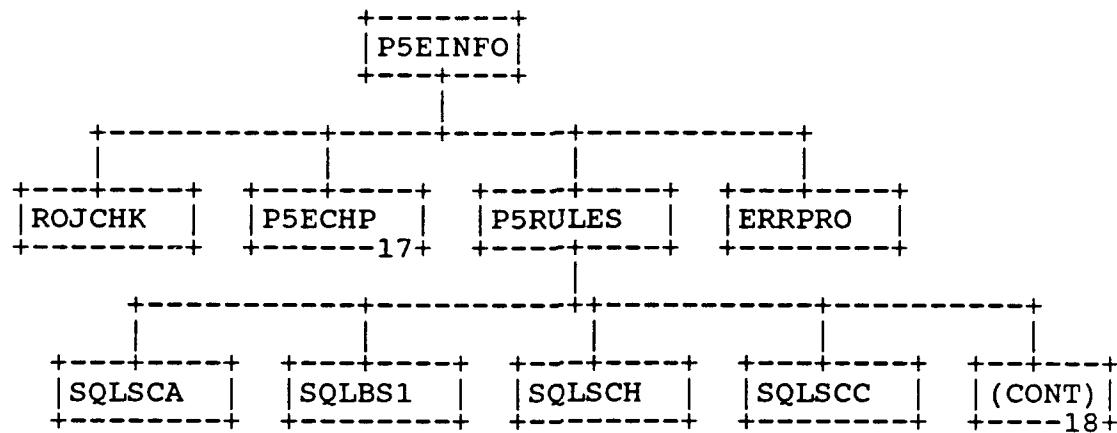


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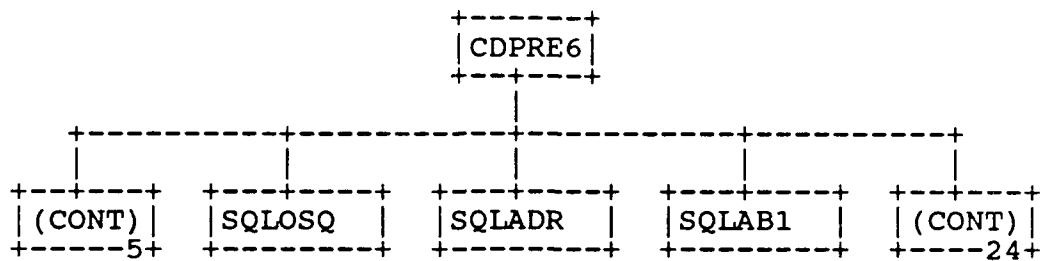
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11

(CONT)	P5HOST	P5HP	P5IAUC	P5KCM	(CONT)
4+	19+	20+	21+	22+	23+

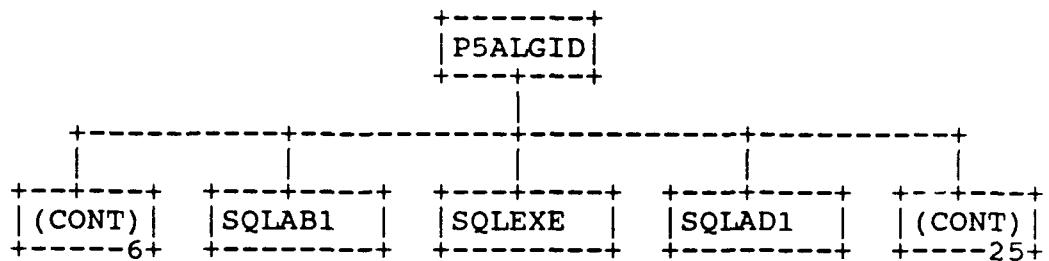
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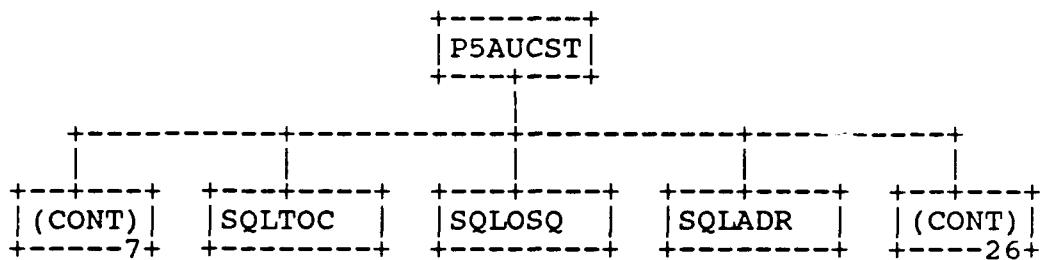
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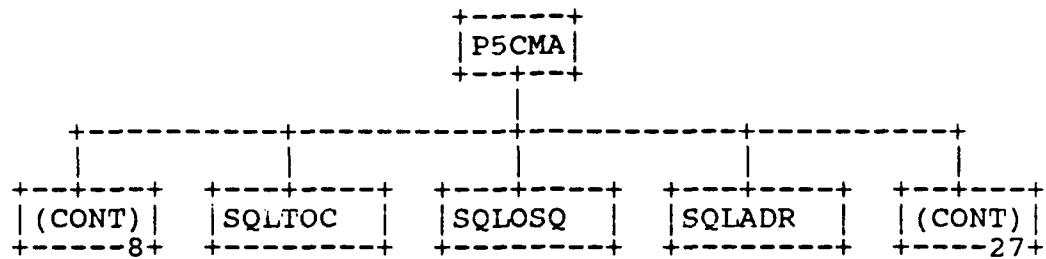
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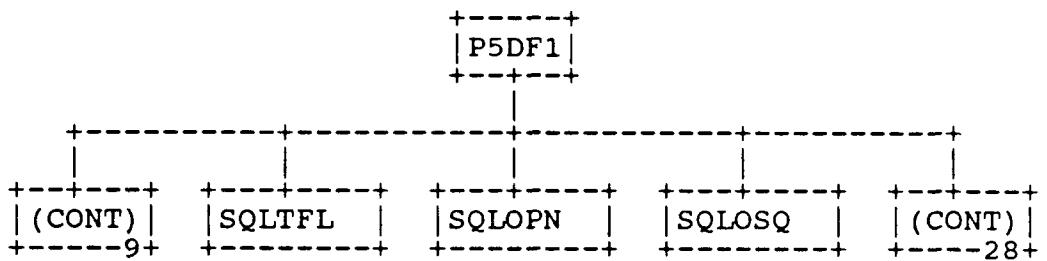
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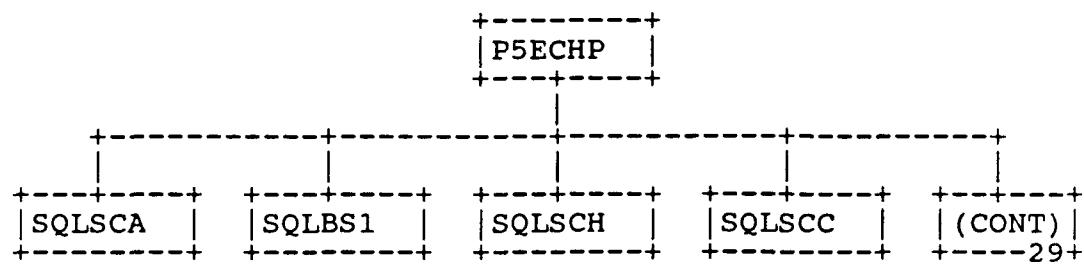
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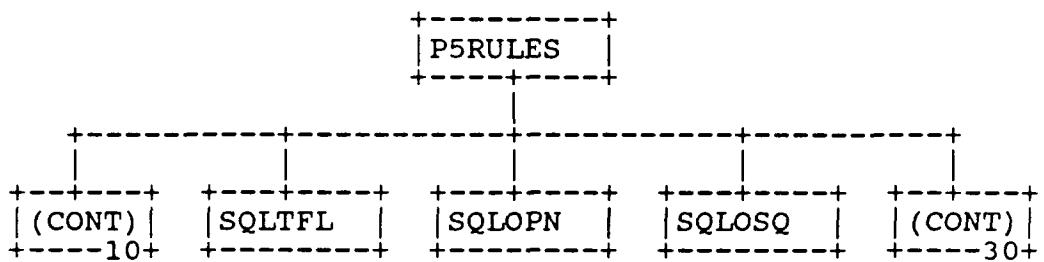


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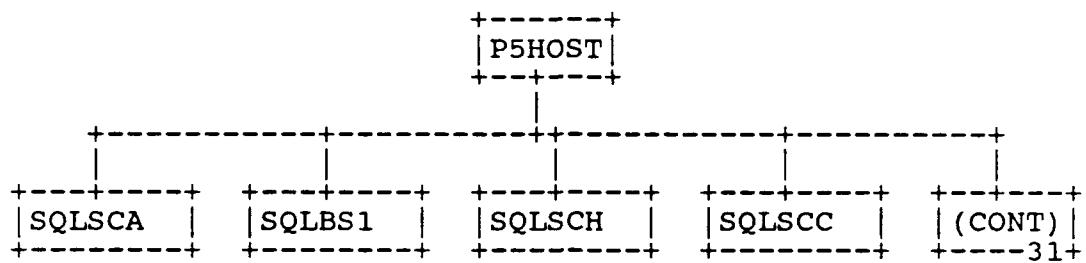


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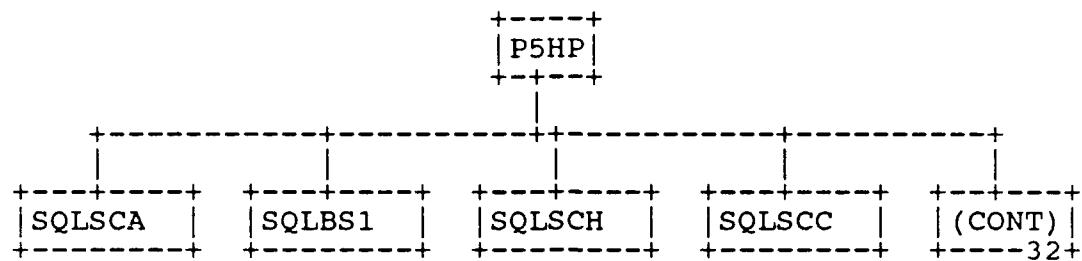
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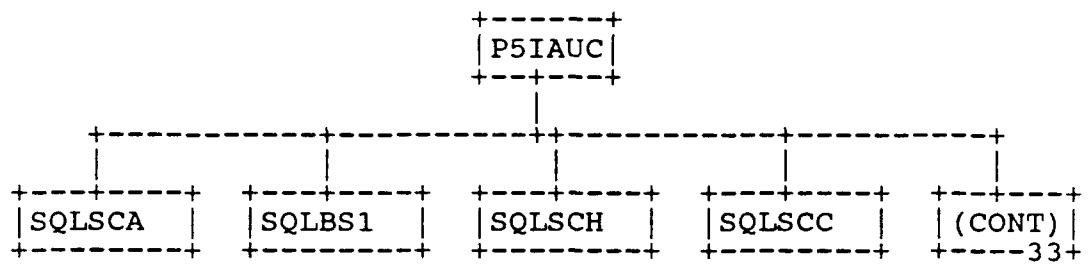


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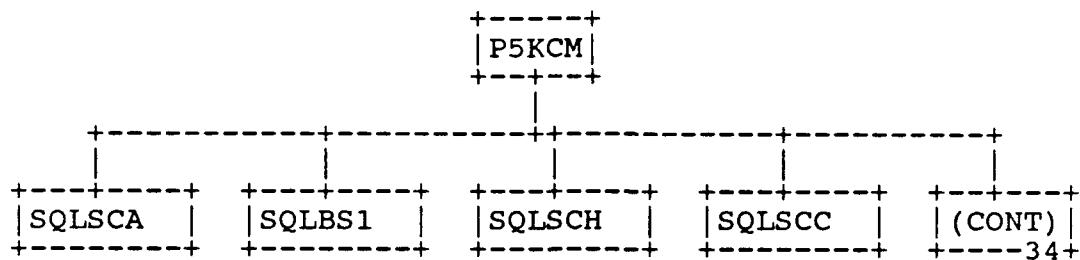


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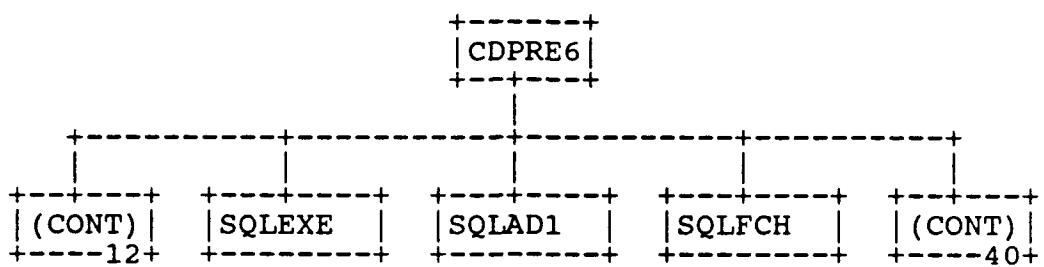
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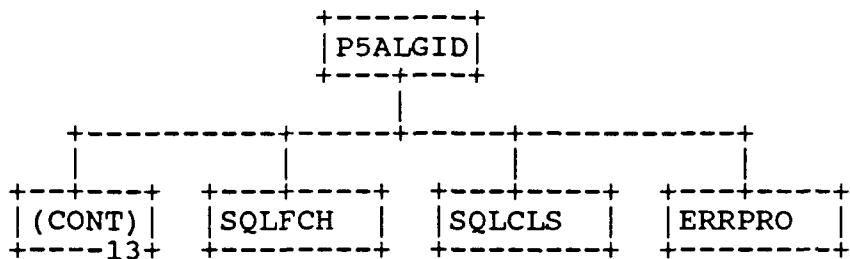
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23

+-----+ (CONT) +-----+ P5MAPAL +-----+ P5PRIM +-----+ P5RCSM +-----+ P5RDF +-----+ (CONT)	+-----+ 11+ +-----+ 35+ +-----+ 36+ +-----+ 37+ +-----+ 38+ +-----+ 39+
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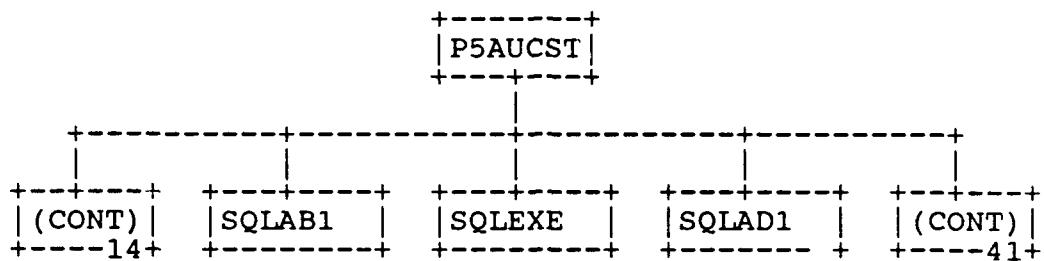


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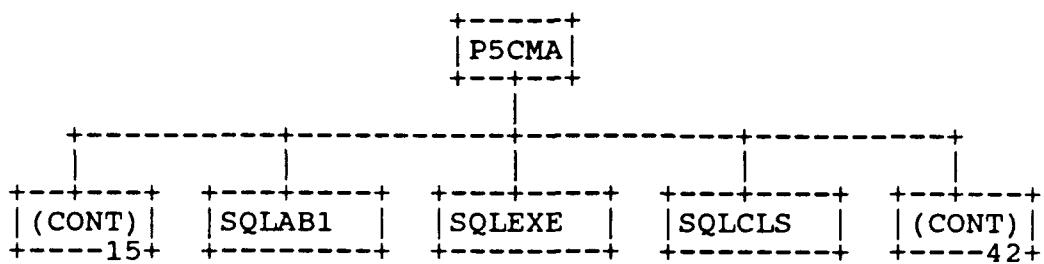
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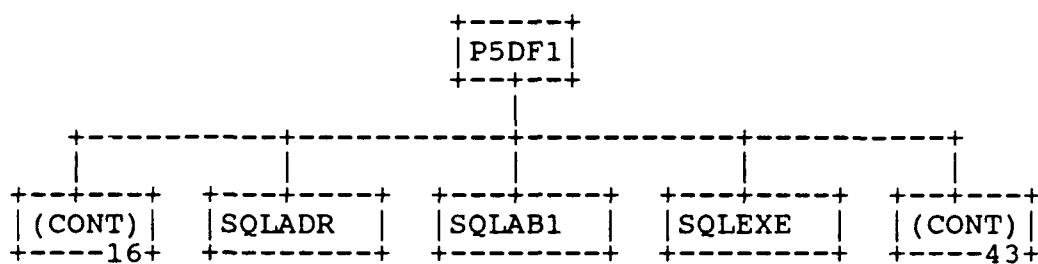
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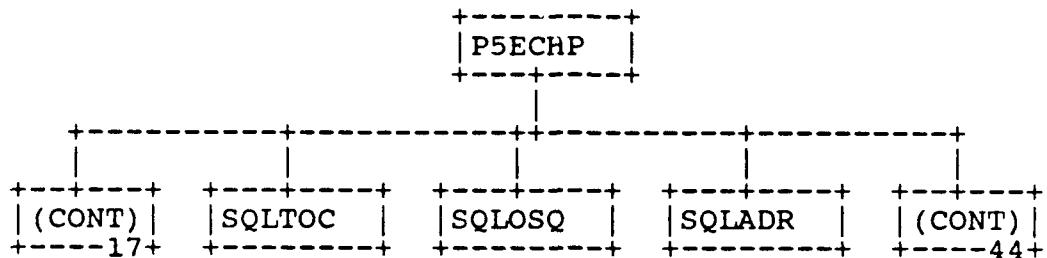
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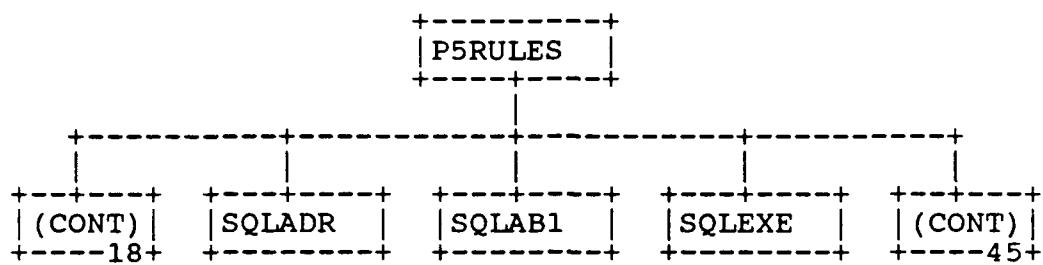
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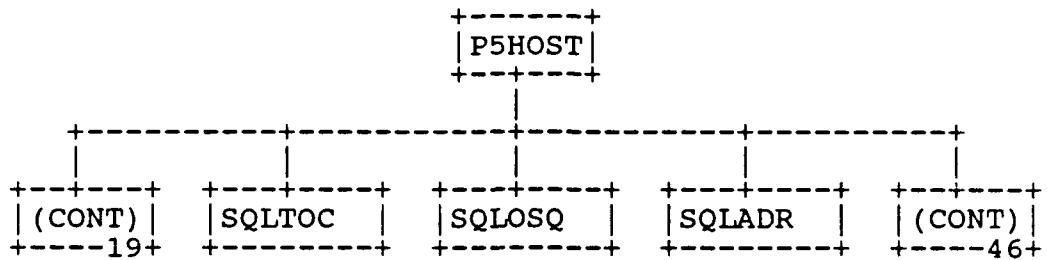
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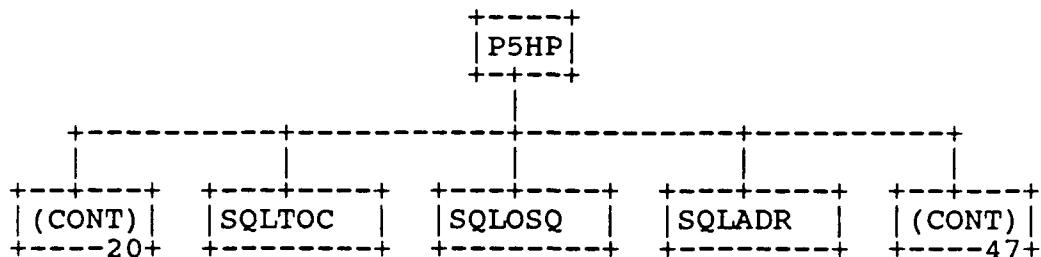
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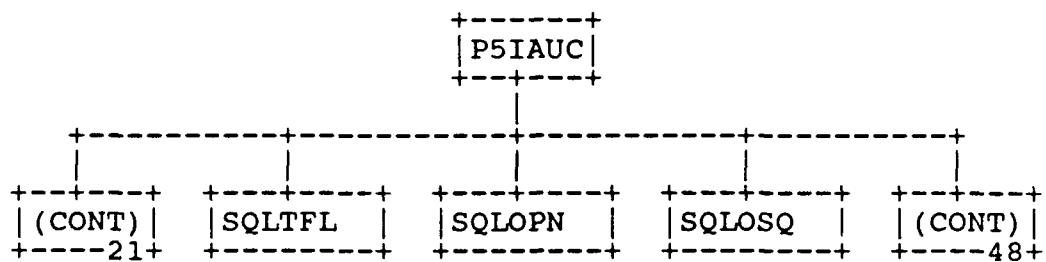
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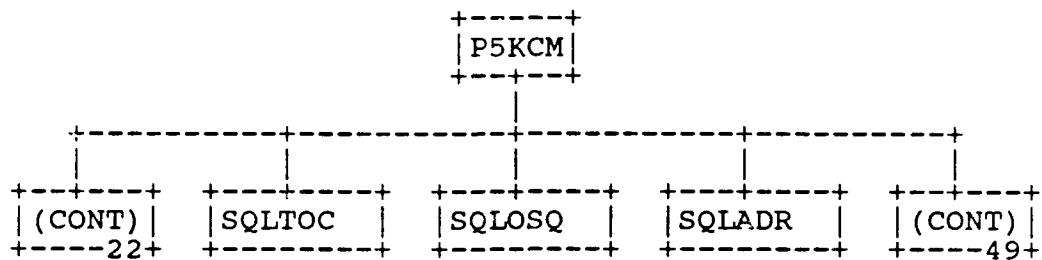




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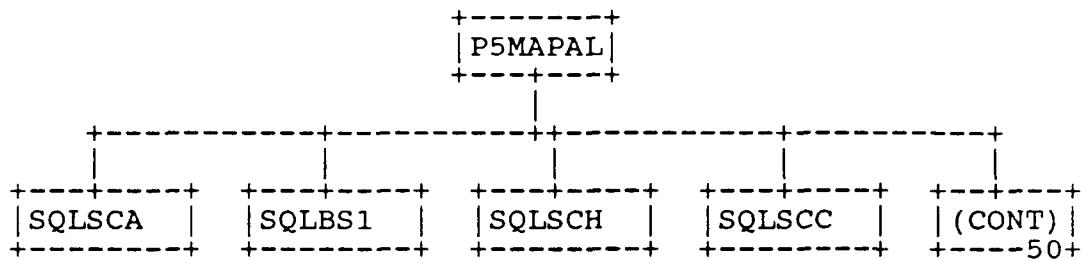
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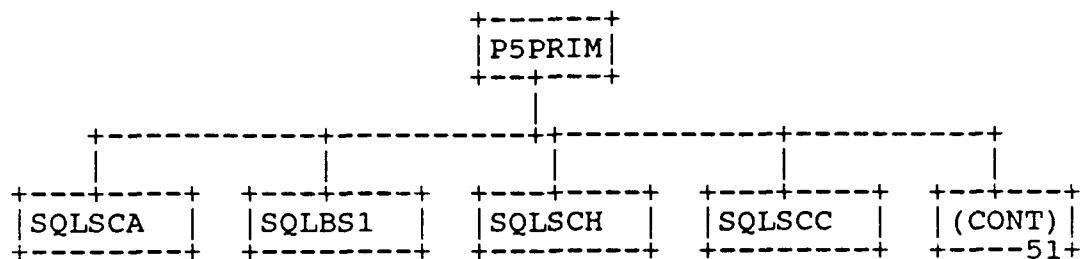
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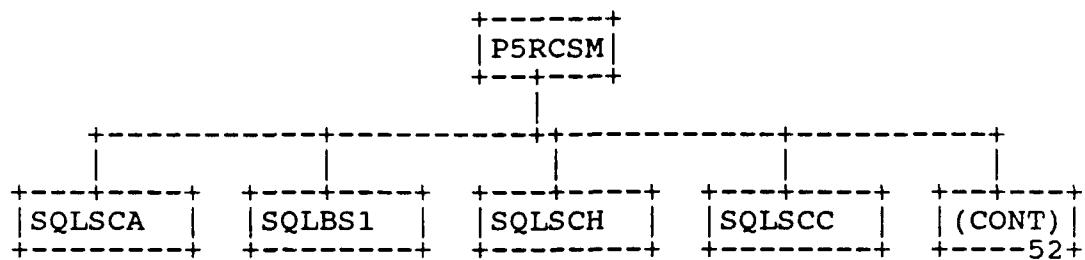
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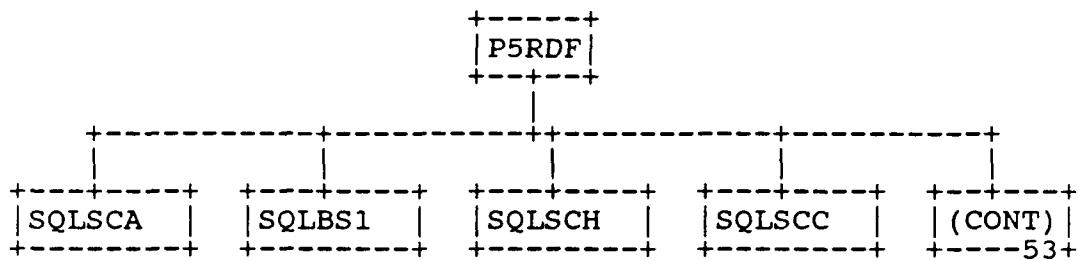


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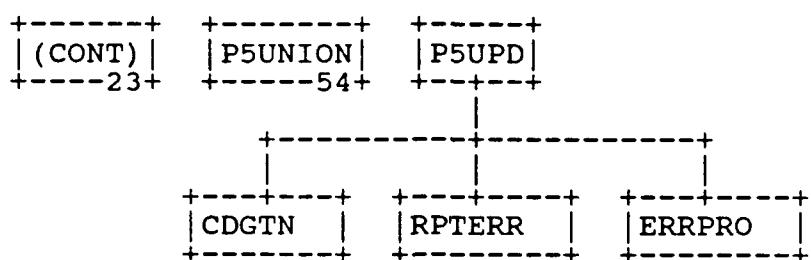






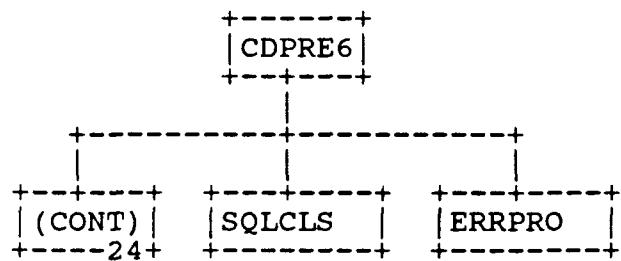
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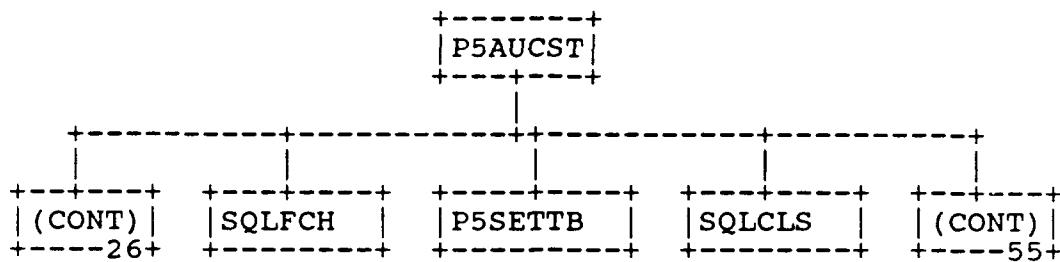
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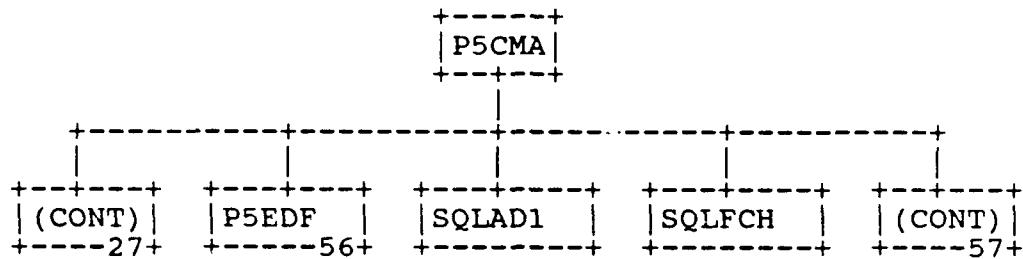
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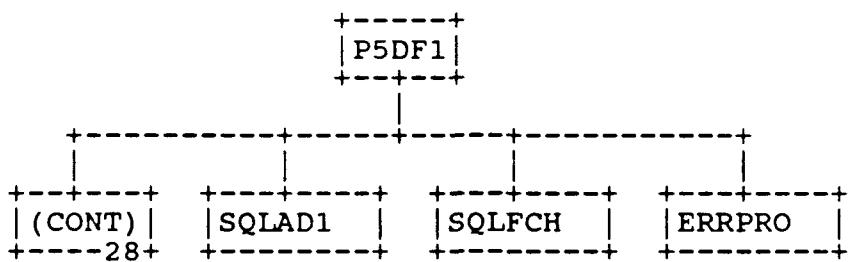
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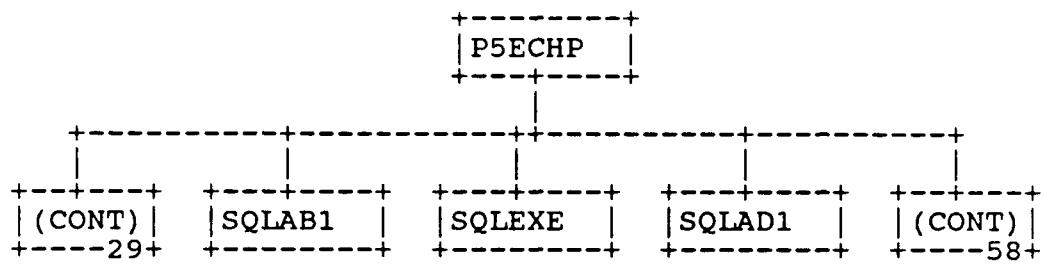
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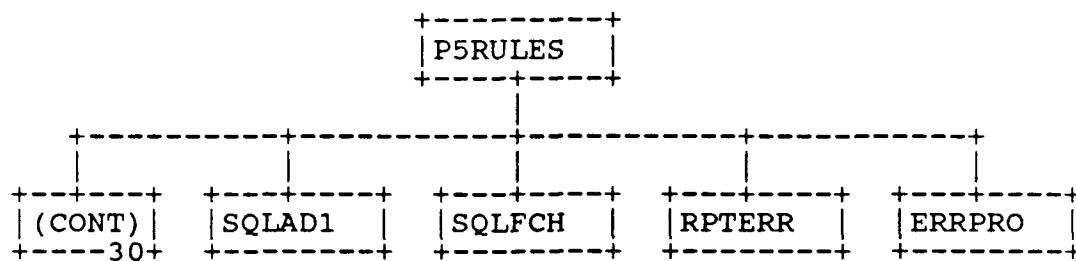
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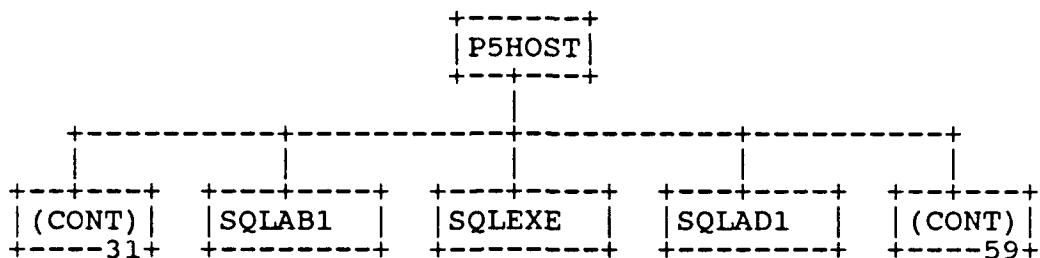
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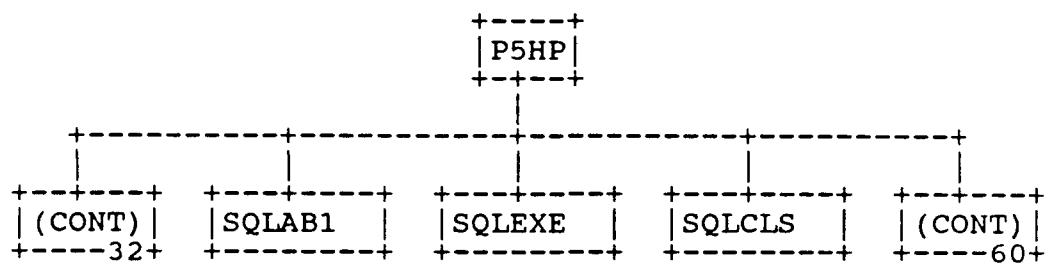
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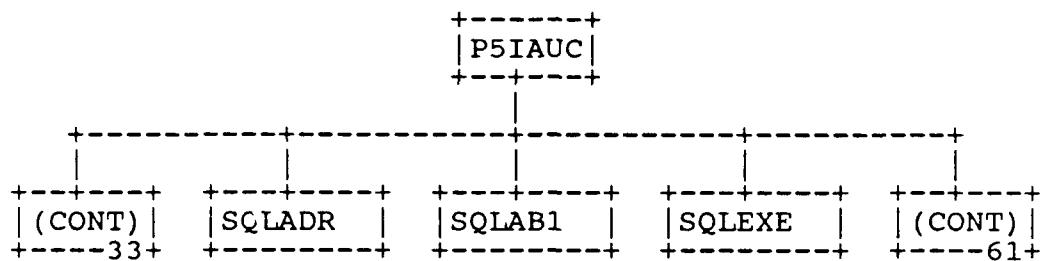
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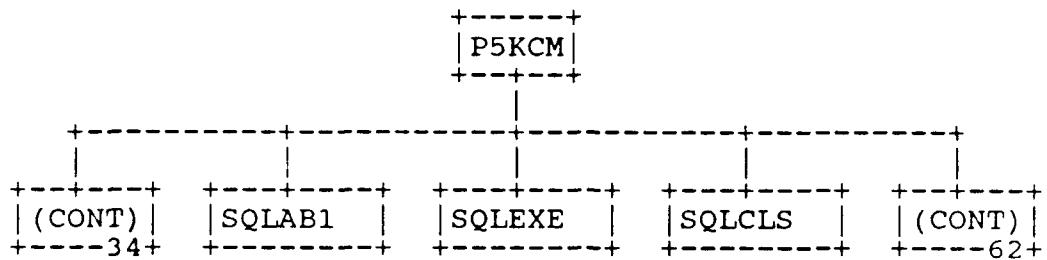
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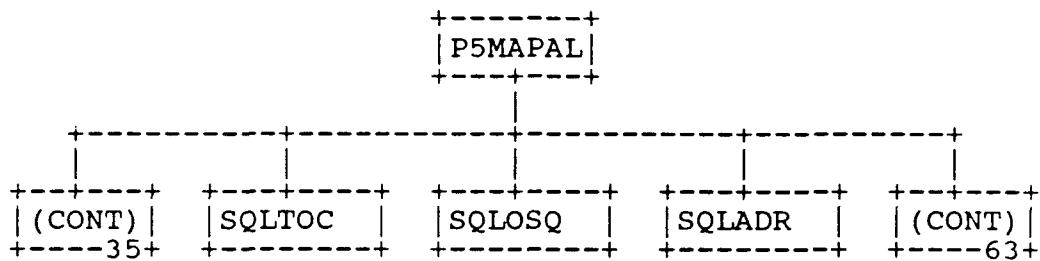


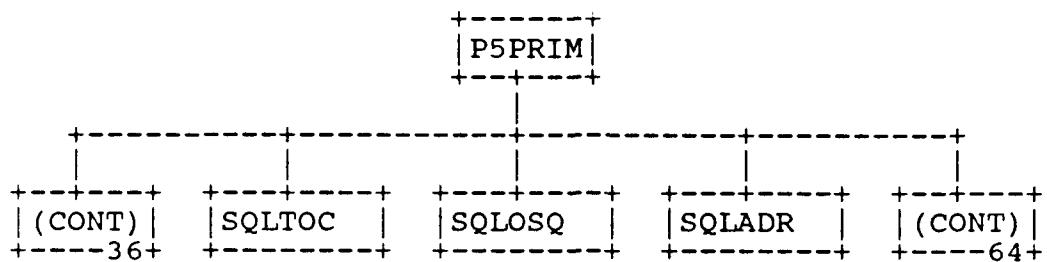
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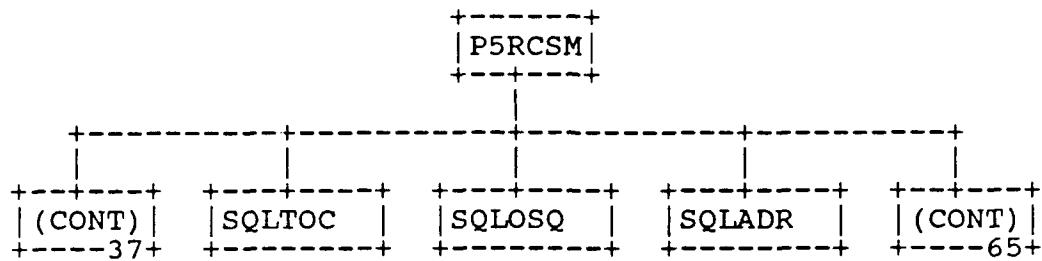
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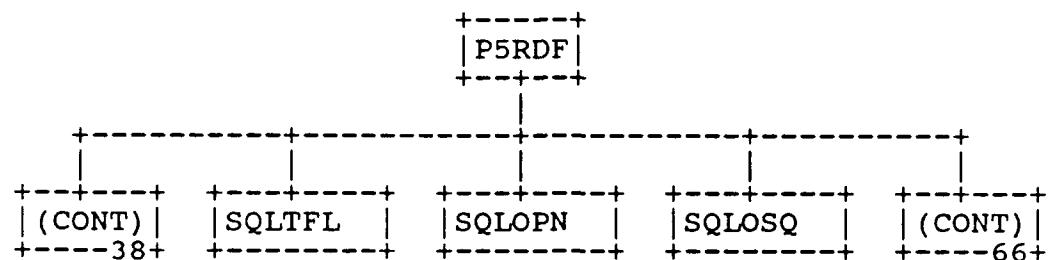






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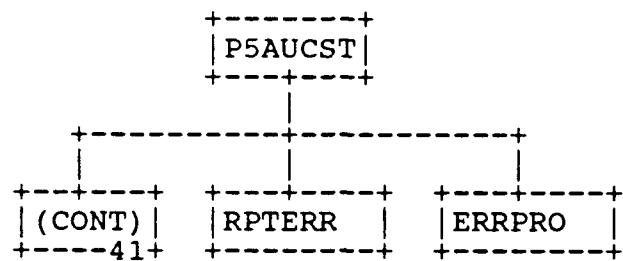
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P5UNION				
SQLSCA	SQLBS1	SQLSCH	SQLSCC	(CONT)

67

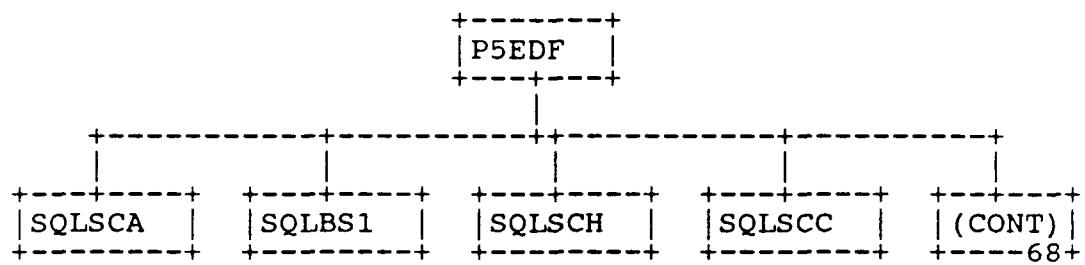
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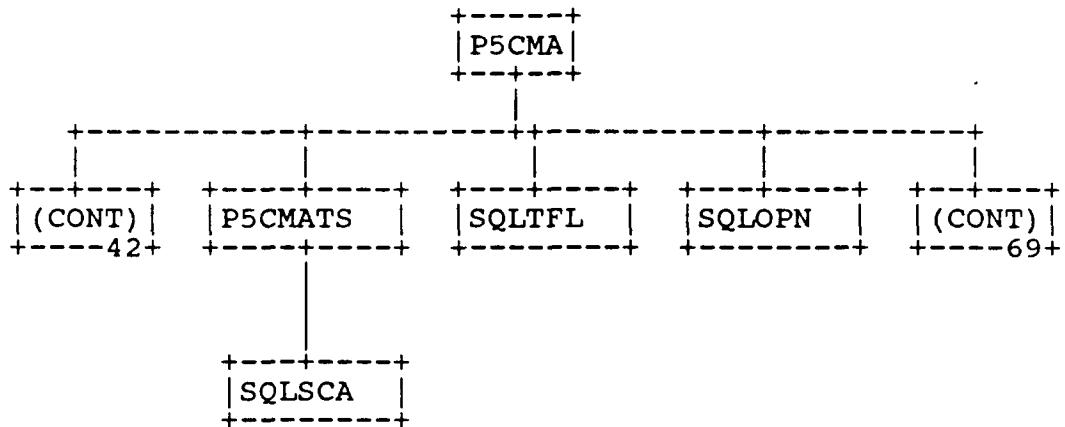
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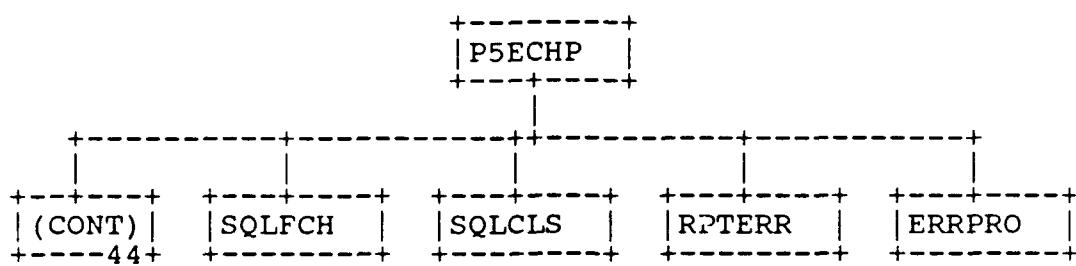
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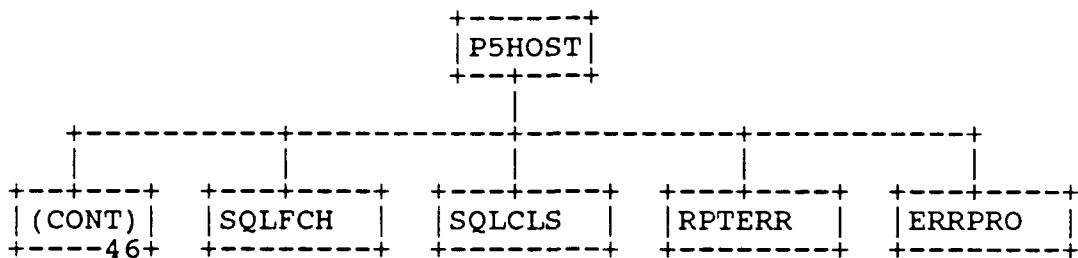
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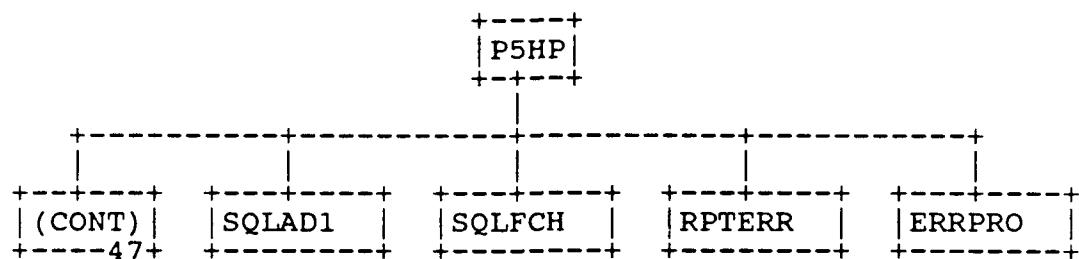
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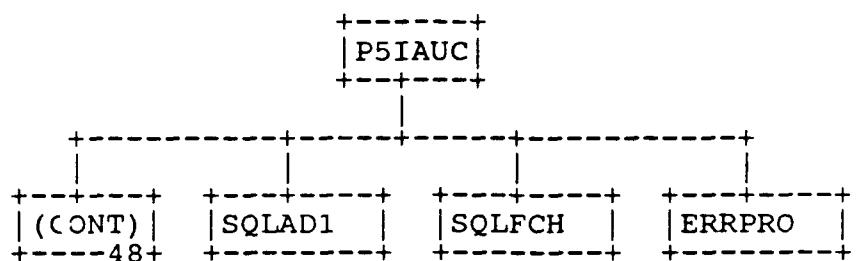


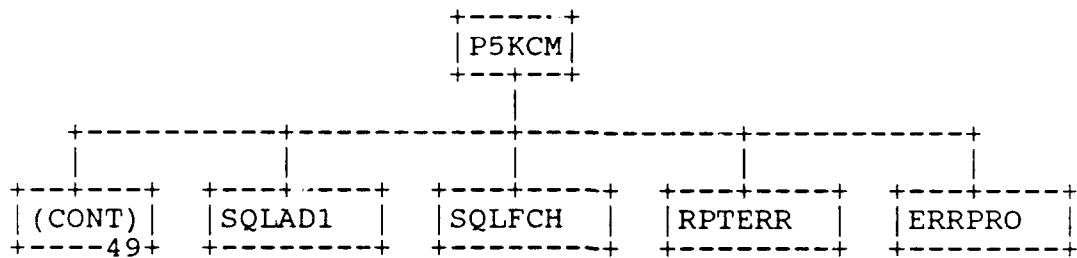
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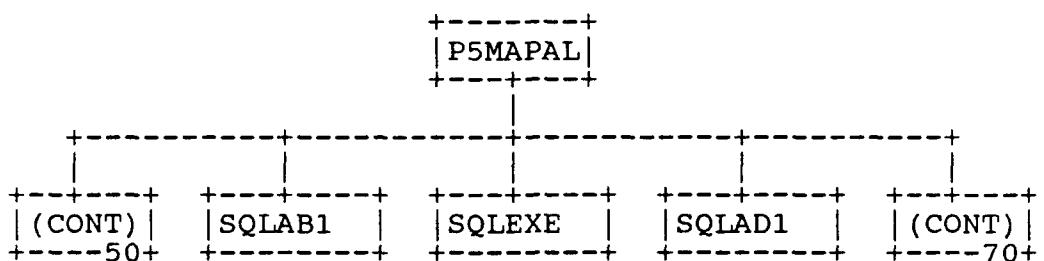
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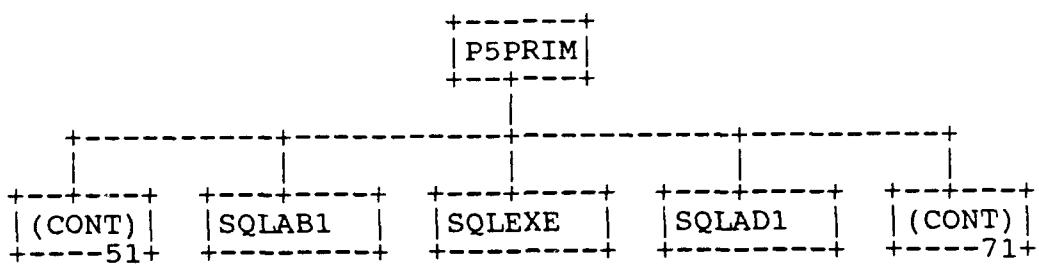
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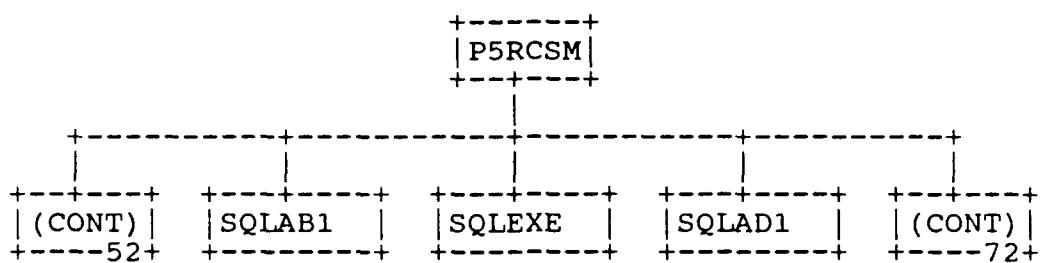
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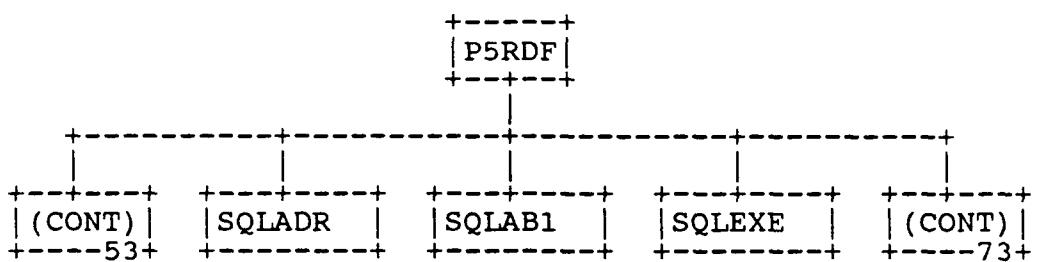
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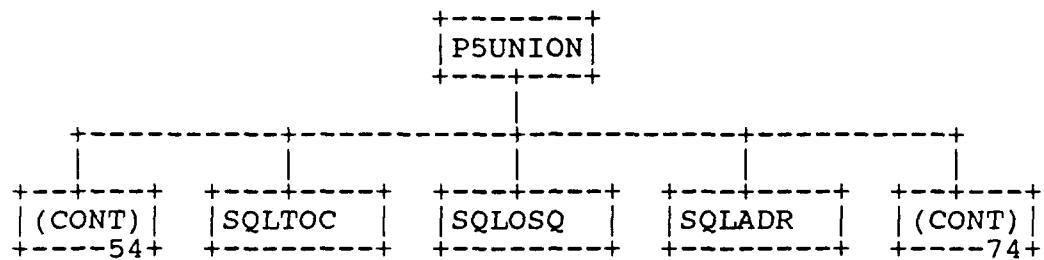
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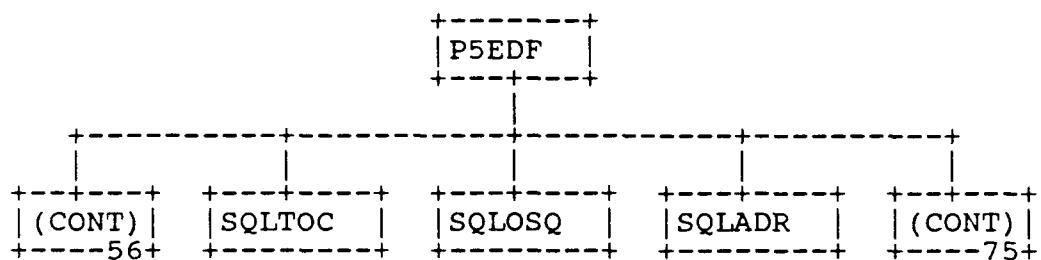
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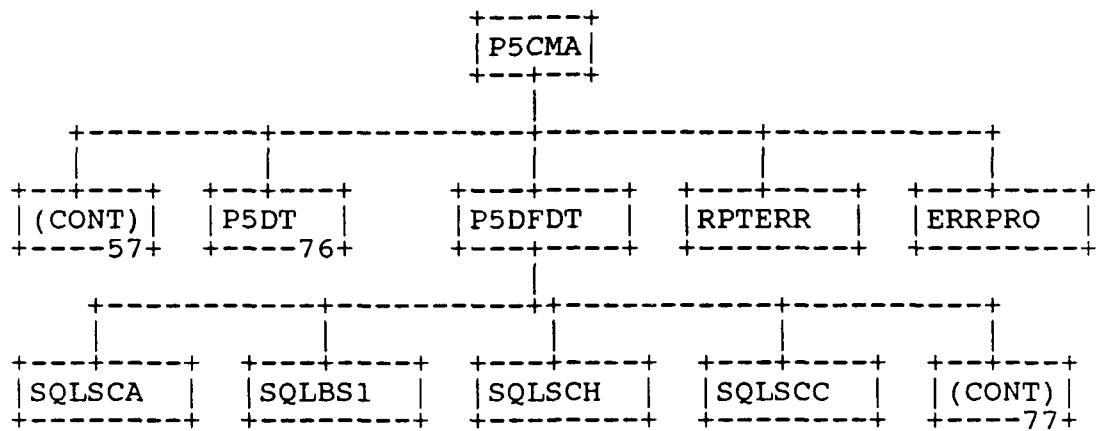
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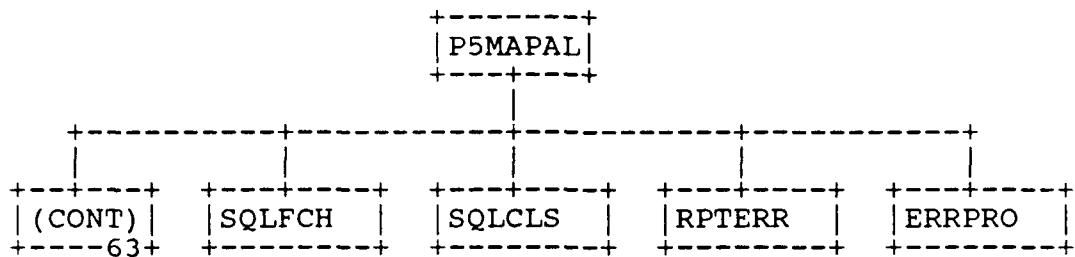
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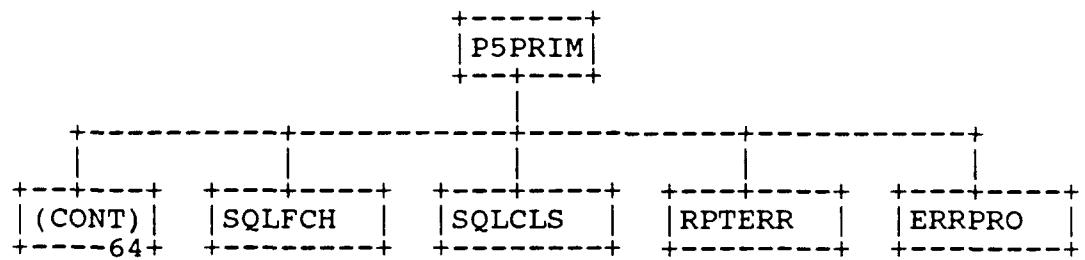


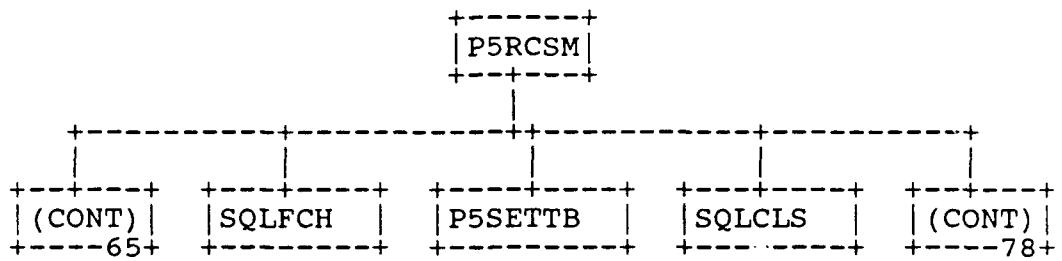
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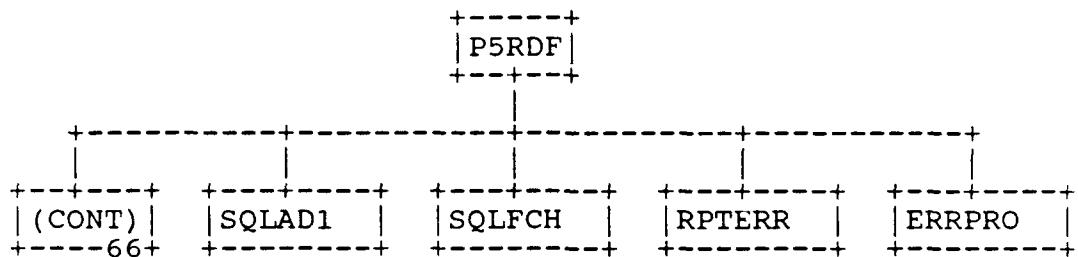
71





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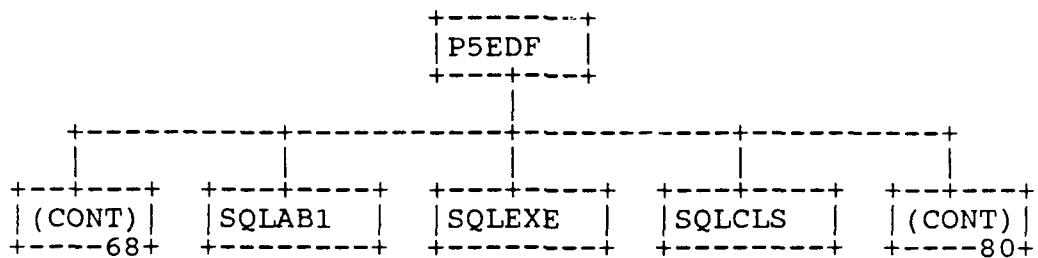
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74

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+-----+  
| P5UNION |  
+-----+  
+-----+-----+-----+-----+-----+  
| (CONT) | SQLAB1 | SQLEXE | SQLCLS | (CONT) |  
+-----+-----+-----+-----+-----+  
| 67+ | | | | 79+ |
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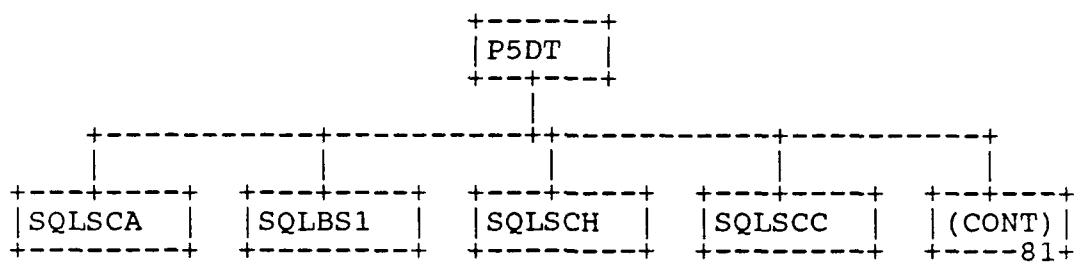
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76



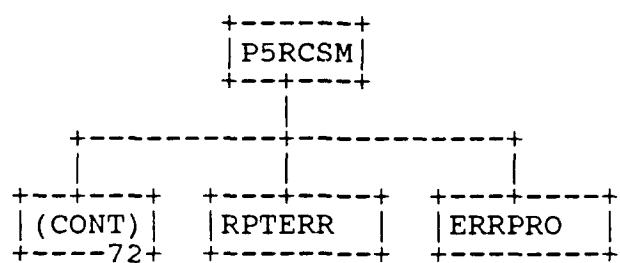
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P5DFDT				
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69+				82+

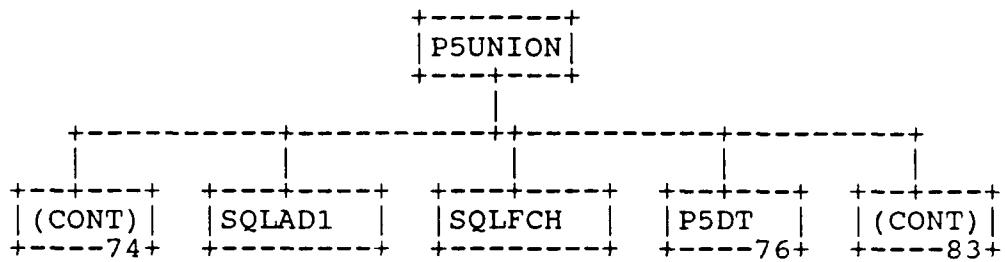
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78



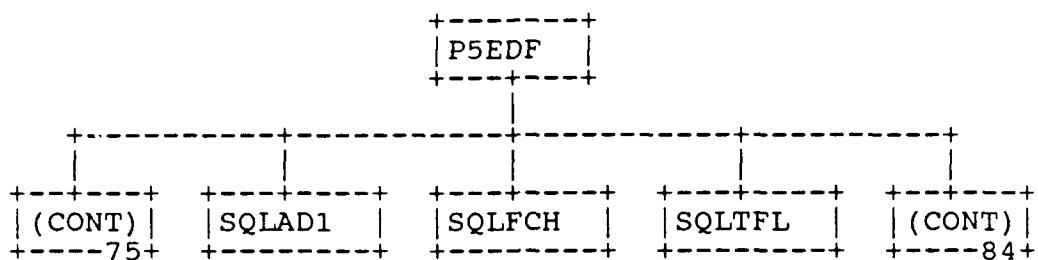
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79



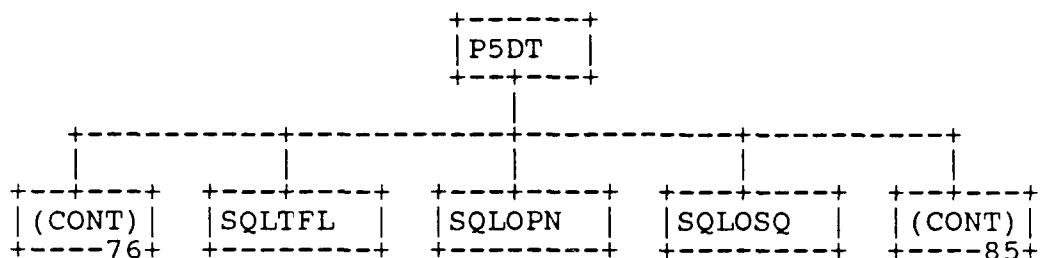
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80



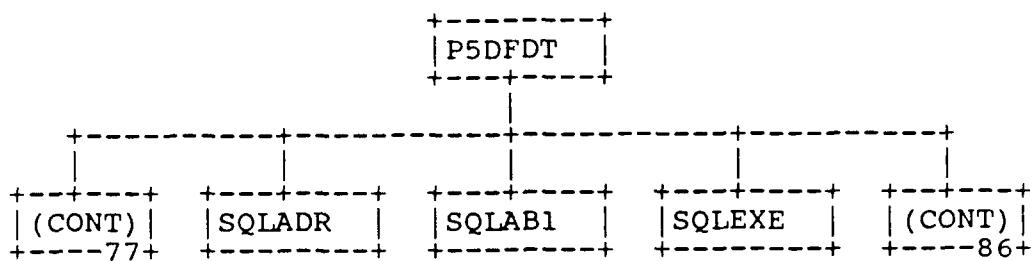
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81



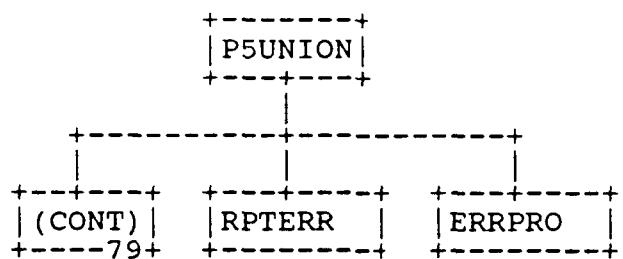
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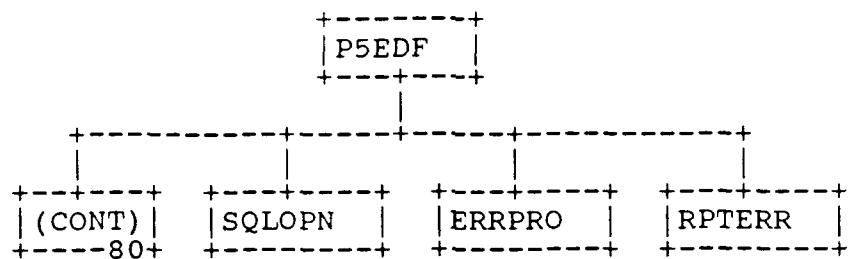
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83



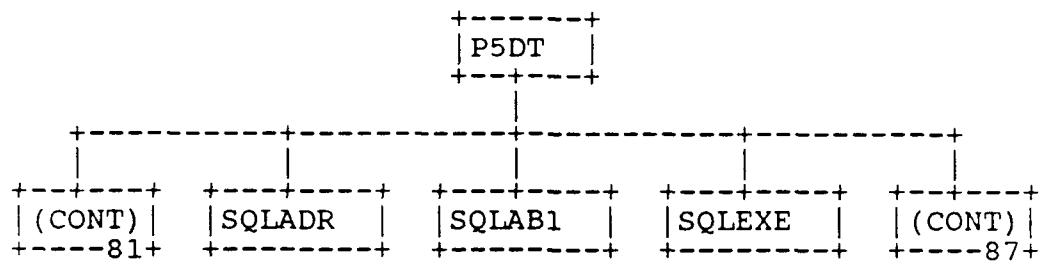
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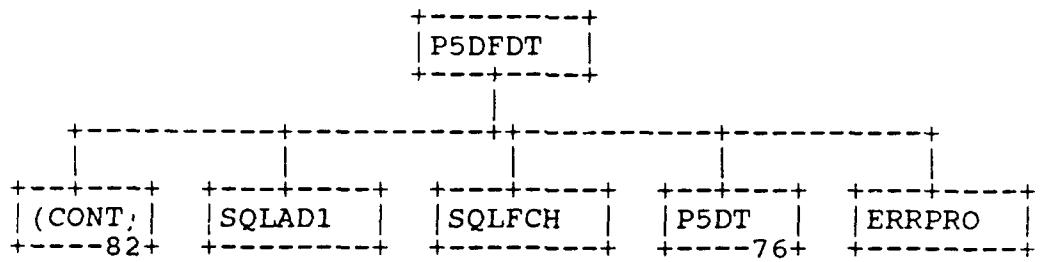
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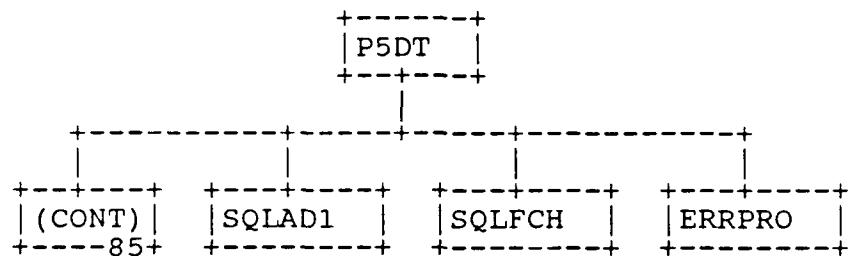
85





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CDGTN
CDPR7KY
CDPRE5A.....1
CDPRE5B.....1
CDPRE6.....2
ERRPRO
P5ALGID.....3
P5AUCST.....7
P5CMA.....8
P5CMATS ...57
P5DF1.....9
P5DFDT69
P5DT76
P5ECHP17
P5EDF56
P5EINFO....10
P5HOST.....19
P5HP.....20
P5IAUC.....21
P5KCM.....22
P5MAPAL....35
P5PRIM.....36
P5RCSM.....37
P5RDF.....38
P5RULES ...10
P5SETTB
P5UNION....54
P5UPD.....39
ROJCHK
RPTERR
SQLAB1
SQLAD1
SQLADR
SQLBS1
SQLCLS
SQLEXE
SQLFCH
SQLOPN
SQLOSQ
SQLSCA
SQLSCC
SQLSCH
SQLTFL
SQLTOC

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3.11 Program Listings Comments

This information is contained in the Module Descriptions in section 3.10.

SECTION 4
QUALITY ASSURANCE PROVISIONS

4.1 Introduction and Definitions

"Testing" is a systematic process that may be preplanned and explicitly stated. Test techniques and procedures may be defined in advance, and a sequence of test steps may be specified. "Debugging" is the process of isolation and correction of the cause of an error.

"Antibugging" is defined as the philosophy of writing programs in such a way as to make bugs less likely to occur and when they do occur, to make them more noticeable to the programmer and the user. In other words, as much error checking as is practical and possible in each routine should be performed.

4.2 Computer Programming Test and Evaluation

The quality assurance provisions for test consists of the normal testing techniques that are accomplished during the construction process. They consist of design and code walk-throughs, unit testing, and integration testing. These tests are performed by the design team. Structured design, design walk-through and the incorporation of "antibugging" facilitate this testing by exposing and addressing problem areas before they become coded "bugs."